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## An Address

### ON THE TREND OF MEDICAL EDUCATION AND MEDICAL SERVICE\*

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ON such an occasion as this it may perhaps be permissible to speak, not so much about the progress of the past year, as of the trend of medical service generally, and of its development in the future.

It is scarcely necessary to say at the outset that medical service has greatly improved in the last generation. The origin of many diseases has been learned, new methods of diagnosis have been discovered, specific treatments have been found, and best of all, preventive medicine has made rapid progress. For all of this we are indebted largely to scientific investigation and herein rests the promise of the future. Facts learned are facts available for further investigation. Discovery leads to discovery in more ways than one. The bringing to light of insulin has provided a means of prolonging life not only in this age but in all ages to come. But it has done more than this. It has fired our students with the spirit of research and our governments can do no finer thing for the welfare of the people than to foster this spirit in every possible way,—facilities, maintenance, remuneration. In this matter our Association has some responsibility, and I trust that in the near future something will be done to encourage clinical research, not so much in the large cities with their shifting populations, as in the smaller places where people and families can be kept under observation over long periods of time.

There is now, and probably there always will be, difference of opinion as to how the various groups engaged in medical service should be educated and trained. If, therefore, one is to indulge in prophecy, the opinions expressed must be regarded as individual, and not as representing the judgment of any organization to which one may belong.

The problem of adequate nursing care of the sick is to-day a difficult one. A graduate nurse who, after meeting fairly high preliminary educational requirements, has spent three long years in training, is entitled to every cent that she gets at the present time, especially since she will do well if she is able to work eight months out of the year. But what proportion of the people can pay for her services? In many instances a nurse with less training would meet the needs of the case. The graduate nurses themselves, recognizing the difficulty that people may have in paying for full attendance are trying out a plan of hourly nursing. In the large centres a few organizations are providing a somewhat similar service. The Red Cross is endeavouring to meet the situation in two ways. About 350 classes for training in home nursing have been established throughout the province in order that the people may learn something about caring for their own sick. In Toronto the Red Cross has inaugurated the splendid experiment of providing housekeepers for the poor in times of illness.

All of these activities emphasize the need for a system of graded education and training for

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nurses. Such a plan to be successful must be in connection with the hospitals and under the control of those who are now responsible for the training of our fully qualified nurses. With courses thoroughly practical from the outset a girl might leave for actual service at the end of six months, or one, two, or three years of training carrying with her a certificate *pro tanto*. It would be necessary to leave the door of her hospital open to her for a limited time in case she wished to return for further training and a higher grading. It must be admitted that such a system would tax the organizing ability of superintendents of nurses-in-training to the limit. The plan suggested is open to the objection that it would interfere with the continuity of the training course. Whatever the solution of the problem may be, the future must see provision made for the nursing care not of some only, but of all those sick.

No doubt some would attempt to draw a parallel between the high cost of skilled nursing and the present relation of doctor and public. It might be said that five or six years of medical education is too long; that a doctor after this expenditure of time (and money) will feel that he must limit his practice to a well paid specialty or choose the city as a field of unlimited opportunity. Shorten the course, they would say, and the doctor will be content with general practice and moderate fees.

Unfortunately there is a difficulty in the way. The medical knowledge of twenty-five or thirty years ago was acquired in four years and this period of study was none too long for some of us. How far would the knowledge of that time carry us to-day? The field of medicine has been constantly widening. How can the period of training remain fixed? And if the field continues to enlarge in the future—what then? Here is a problem for the wisest, and I hand it unsolved to you. May I complicate your problem by throwing in a few personal opinions? (1) At the present time the medical student's preliminary education in classics is not sufficient. (2) The nearer the student is to maturity before beginning his medical course, the better. (3) The student during the first few years of his course stores away many facts derived from his study of the fundamental sciences. He may not see their bearing on the practical side of medicine, and so when he needs them most in the later years, he may not be able to find them. Now if

the student could have linked up the facts with their practical application early in the course, the facts would not have been forgotten. The moral is that the study of the basic sciences in the early years of the medical course should be correlated with clinical observation. (4) A good deal of time in the medical course will eventually be given to applied psychology, and more difficult still, doctors will have to be found who are capable of teaching it,—or will you provide professors of psychology, who have had experience in the practice of medicine?

Frankly, the problem of medical education is too serious to be attacked in a controversial spirit. It involves many questions. Where is the line to be drawn between pre-medical and medical education? Are the sessions too long to permit the poor man's son to work his way through college? Could any subjects in the curricula of the different schools be curtailed or dropped without seriously affecting the courses? Should any subjects be added, or should more attention be given to subjects already taught? I leave the problem with you for careful thought, especially as you know there are differences of opinion among the teachers of medicine themselves.

Our Association has taken an active part in post-graduate education for several years. Since it began nearly four years ago about 925 lectures and clinics have been given throughout the province. In most cases the speakers have come from the universities and for their active co-operation we must again express our gratitude. There has been, however, an increasing number of speakers coming directly from our affiliated societies, and this in itself is an evidence of an educational awakening throughout Ontario. We have, as it were, an extramural university gradually coming into existence.

While this post-graduate movement has been useful in building up and strengthening the county and affiliated societies (the vital units of which the Ontario Medical Association is composed), its great value lies in its effect on medical service. It brings men and women together for study and for interchange of opinion. It stimulates reading. It forms a contact between the universities and their graduates to the end that both are benefited. Teachers get a better idea of the needs of men in the field. The men in general practice obtain a better appreciation

of the practical value of recent methods of diagnosis and treatment.

Is it too much to expect that as an outcome of this work there will be a development of clinical research in general practice? There is already some evidence of this in our programme at this meeting. You will recall that the late Sir James Mackenzie went even to an extreme in urging general practice as a field for clinical research. And no wonder, for it was in general practice that he laid the foundation of our present knowledge of heart disease. You will remember, too, that after reaching the pinnacle of fame as a specialist he went back to general practice to do research work. One may not catch all of his enthusiasm, but the fact remains that the field which lured him back from Harley Street is well worth cultivating.

This rapid survey would not be complete without reference to those who to-day in Ontario are taking the full responsibility of treating the sick by manipulative methods. Up to the present it has been possible for a person with little or no education to call himself an osteopath or chiropractor, prefix his name with the word "doctor" and prey upon the public. There is good reason to believe that this will soon be a thing of the past. As a result of recent legislation a Board of Regents will be appointed to control this method of practice. The Board will be made up largely of the so-called "drugless practitioners" themselves and it is to be hoped that their best representatives will be selected.

Our American neighbours are facing the problem of the unequal distribution of medical service. Apparently there is a strong tendency over there for the doctors to desert the rural districts and concentrate in the larger centres. Here the problem is not likely to become a serious one. Organized medicine is making the country more attractive to the doctor through extension lectures and clinics. He is getting more of the advantages of the city without having to put up with its disadvantages. In certain parts of Ontario, however, there is inadequate service. The reason is that these areas are too sparsely settled to afford a living to a doctor. The settlers in these districts must, it would seem, pay the penalty for their boldness in opening up new country for us. No doubt some recent graduates with high ideals of medical service would go to these outposts if they could

be assured a living. This matter is worthy of serious consideration by our legislators.

The cost of medical service must always be a matter of concern to the patient. Hospital care to-day is rendered more expensive by modern laboratory methods and by many other seemingly unavoidable factors. Whether this cost can be reduced in the future remains to be seen. It is a problem which will doubtless receive the attention of the recently formed Ontario Hospital Association which had its origin in our committee on hospitalization.

Even the cost of medical attendance has its upward tendency. The public, however, should realize that it is no longer enough to look at a patient's tongue, take his pulse and temperature, apply a hasty ear to the chest and make a "snap" diagnosis. The time required for an examination will vary with the circumstances, but a thorough investigation must include laboratory tests which are generally made in the patient's absence and are not usually thought of as occupying time. In fact, the time spent by the doctor on a case is the best and fairest basis for computing a fee. It is difficult at times to decide how far the investigation of a case should go. For example, it is not always fair to the patient that he should have to bear the expense of radiological or other special methods if a diagnosis can be made without them. The doctor must always shoulder the responsibility for the things left undone, but he should also bear in mind the patient's resources.

Some day the total cost of medical service will be cut down to a large extent when the practice of periodic physical examinations becomes general. Statistics prove beyond all doubt that the loss of time through sickness and its consequent cost of medical service can be materially lessened by the examination of people when they are apparently well. Certain insurance companies found this out first and as a result have saved millions of dollars. The periodic examination discovers faulty modes of life which undermine the health. It ferrets out disease before it has come out in the open. Such an examination to be worth anything should include a careful history, a painstaking physical examination and a chemical and microscopical urinalysis. It cannot be done in much less than an hour and the person examined should expect to pay accordingly.

One can scarcely consider the financial aspect of medical service without thinking of a uniform distribution of cost such as might be brought about by some system of public health insurance or of state medicine. If anything of the sort could be evolved in such a way that the present relation of family physician and patient would remain unchanged, that the doctor could retain his initiative and ambition, and not become a disinterested cog in the machine, that the patient would still be regarded as an individual rather than a case,—then up with both hands for the system! These are conditions that have not been fully met by any plan in existence and until human nature changes, we must wait and hope for this Utopia.

And now as to the doctor himself. Modern conditions have brought with them new dangers. With the spread of special practice extremists are easily bred. The corrective lies in a free interchange of opinions between various groups and this year's substitution of a general programme for the old sectional meetings is an experiment toward that end. The future will see more conservative surgeons and less prejudiced internists. No operation will be performed until a thorough physical examination and adequate laboratory tests have been made. The diagnostic ability of the surgeon will more often be required and the opinion of the internist will have more weight. Out of education should grow co-operation and the movement should begin at the fountain heads of education, in the universities, where at present the boundaries between the specialties are often too sharply defined.

There is a real danger that in the intensive training of to-day some one will forget to imbue the student with the old and high ideals of the medical profession. It is so easy to give an impersonal service in the hospital wards. It is so difficult for the specialist who sees a patient once or twice to regard him as anything more than a case. And yet the graduate in medicine who goes out to practice should have already grasped the true significance of the word service. It is true that if he is so fortunate as to go into general practice (if only for a time), he will become acquainted there with all the faults and failures, with all the hopes and aspirations, with all the troubles and burdens, with all the pain and sorrow, of the people whom he attends. And he will learn too that his treatment must take all these things into consider-

ation. He will be twice fortunate if he has learned something of this during his college course.

In what has been said of the present and future position of medical service one essential principle might have been stressed again and again. It is embodied in the word "organization." Through organization there is wide interchange of ideas and the stimulus of association. It can provide the most suitable conditions for work. It brings many minds to bear on difficult problems. It reinforces individual effort by collective influence. But there is another aspect of medical organization which we as Canadians cannot overlook. Our duty is not done when every part of this province is united in a strong association. We cannot afford to be provincial, self-centred and self-contained. Between coast and coast of our Dominion there are geographical divisions, and problems of trade and transportation, all of which tend to weaken the bonds which hold us together. The safety of Canada as a united country hangs on strong national organizations whose members have common interests and high ideals of service. For this reason, if for no other, the Canadian Medical Association should have the support and cooperation of every doctor in Ontario.

Nor can we forget that the bond which has always existed between doctors in Canada and the mother country has been strengthened during the last year by the affiliation of the Canadian Medical Association with the British Medical Association. Already organized medicine in Canada has profited by this closer union. One of its first fruits is shown in the presence here to-night of our distinguished guest, the President of the British Medical Association.

Finally let us not mistake the meaning of this word "organization." It is not, or should not be, a *structure* unchangeable and bound by precedent, exerting its influence only on the few within its walls. Rather it is, or should be, an *active force* directed toward a definite goal. Its methods must change with new conditions. Both within and without our ranks it must educate the uninformed (or misinformed); it must stimulate the indifferent; it must influence the unwilling. It may leave itself open to criticism through its aggressiveness; but, if the goal of our organization is the highest type of medical service for the people, we need have no fear of the future.



## An Address ON THE PRESENT STANDING OF THERAPEUTICS\*

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THE American Therapeutic Society was founded with the object of furthering in every way the study of therapeutics, or to actually quote Article II of the Constitution, "The object of this Society shall be the promoting of therapeutics in its broadest sense." It is twenty-six years since it was organized under the able presidentship of the late Horatio C. Wood and one has only to read the transactions of the meetings since then to see how faithfully the members have kept this object in view.

The question is sometimes asked, why should we have a society for promoting the study of therapeutics when this subject, the care of the sick, should be the object of every practitioner and hence of every medical society? But while this on the surface sounds a fair criticism one has only to know the character of the teaching in most clinics to see what a difference there is between the amount of attention given to diagnosis and to treatment. This is not said in any way as a slur on the internist but merely to point out that as diagnosis naturally comes first it gets the first place and is thus apt to occupy most of the limited time of the clinic. The hour is generally almost finished about the time that the treatment is reached, and this, which from the patient's point of view is the most important part of the seance, is often largely left to the keen but relatively inexperienced house-physician. On this account most medical schools now set apart a certain number of hours in which treatment shall occupy the chief place. In some centres, as for example Edinburgh, Birmingham, Durham and Liverpool in Great Britain, and Yale, Jefferson and Toronto on this continent, the subject is raised to the dignity of a Chair. In some this Chair is combined with that of pharmacology, materia medica, or clinical medicine. In many schools members of the staff of clinical medicine are deputed to give this

course. By way of ascertaining the views of young practitioners upon the university course that they had recently come through, Dr. Irving S. Cutter, Dean of the University of Nebraska College of Medicine, made an enquiry among a large number of graduates of a selected group of schools asking in what particulars their *alma mater* had failed, either through omission or commission. The replies fell into four categories.

First.—That a large part of the time of the undergraduate is wasted in the clinical years in studying rare cases which as a class will probably not be seen again by fifty per cent. of the medical graduates.

Second.—Failure of the clinical instructors to emphasize the correct management of the case.

Third.—Inability of the graduate to diagnose and properly handle cases of common, ordinary ailments that form the great bulk of cases in office practice.

Fourth.—Inadequate emphasis on therapeutics.

It is not clear to me why Dr. Cutter groups the management of cases and the handling of cases separately from the fourth class of therapeutics as the last-named surely includes the other two, but otherwise the results of the enquiry are interesting and emphasize the importance of our subject. Dr. Cutter goes on to say, "Emphasis in clinical teaching has been placed on diagnosis. Once the diagnosis has been made the clinical teacher too often loses interest in the patient, and although unusually careful management may be required, he fails in this particular."

Therapeutics owes a great deal to the young science, pharmacology, and the debt is every day becoming greater, but there is a large part of treatment where pharmacology can give no help. Pharmacology bears much the same relation to therapeutics that physiology does to medicine, and the pure pharmacologist is

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no more a physician than is the pure physiologist. Mr. Abraham Flexner in his recent book on *Medical Education* says, "Toxicology and experimental pharmacology must form the basis of instruction in therapeutics, though therapeutics will not be really well taught unless clinical teachers, well trained fundamentally, teach the subject at the bed-side." And again, "It is the physician at the bed-side who has the final say as to the value of any medicinal agent."

Therapeutics is not the treatment of disease, but the care of the sick, which is quite a different thing, and includes everything which will help the patient in his struggle back to health. Drugs only occupy a small place in the treatment of many people, and often the skilful arrangement of the environment including the psychic poise of the sufferer, the careful regulation of the diet, proper exercise, massage, etc., will be all that are required to restore the patient to health. As has been well said, there is more in medicine than medicine.

Therapeutics is an art as well as a science; an art that has been handed down to us from the ages. An art the details of which have constantly changed and are still and always will be in a state of flux, but an art that is gradually improving, so that the sick man can hope for greater relief now than could his progenitor of long ago.

It is interesting to note how fashions change in treatment. For example, digitalis was in the London Pharmacopeia of 1665 and several subsequent editions and was then deleted for over a century until Withering heard of its virtues from an old wise woman and replaced it on its now firm pedestal. The ancients seem to have used anæsthetics long before the Christian era and yet these disappeared from practice until last century. Apparently vaccination against small-pox was used in India over three thousand years ago as it is on record that a Hindoo physician, Dhanwantari, who lived about 1,500 years B.C., described it and even the method of obtaining the virus from the cow's udder. The use of iodine is a typical example of the fluctuations of fashion. The Greeks used to administer the ashes of sea weed in the treatment of goitre. Pure empiricism, to be sure, but they got results. A century ago scientific medicine no longer gave these ashes but held in high

repute the chemical element iodine. In a small treatise written in 1824 a Dr. Gairdner, of London, urged the use of iodine in goitre. "Yet," says a writer in a recent *Spectator*, "until the other day we of the present century had forgotten iodine in its most valuable uses, and thought of it merely as an excellent local antiseptic or agent for local painting over some local inflammation." And he goes on to say, "The folly and the malign power of fashion, nowhere more evident than in the history of medicine, are shown when we recall that thirty years have elapsed since the chemists proved that iodine is the most abundant and characteristic constituent of the 'internal secretion' by which the thyroid does its creative and protective work for our lives. Yet not until 1917 was so obvious and hopeful a clue followed."

Most of our therapeutic art has arisen empirically and much of it is still empirical, but none the less valuable on that account. The word *empiricism* has sometimes been twisted to mean ignorant interference and almost quackery, but this is quite wrong. In Lippincott's new dictionary it is defined as "the knowledge of physics acquired by experience alone," and in Murray's new dictionary the *empiric* is "one who, either in medicine or in any other branch of science relies solely on observation and experiment." The word of course is derived from the Greek *empeiria* which means experience. That we cannot yet explain how some remedy acts is no reason why we should not use it if experience has shown that it gives relief in some ailment. After all, how little we really know even of what seems most evident! It is known empirically that morphia relieves pain, but we do not know why. We know that malaria is controlled by quinine, but we do not know exactly how this effect is brought about. I recently heard Sir Oliver Lodge lecture on his favourite subject of the possibility of communicating with those who have passed beyond, and when some of his audience looked dubious he said, "You wonder how this is possible and I reply by dropping this pencil on the table, and ask you why it fell. You answer, of course, that it was due to gravity. Well, I say, but what is gravity—merely a name given to the attraction of bodies for one another in proportion to their mass, and if I ask you why they so attract each other you cannot say." We find

by experience, or experiment which is really the same thing, that certain medicinal agents act in a certain way, and take advantage of this in the treatment of diseased persons, always, of course, striving to find out in what way they act, but in the meantime admitting our ignorance. The know-all seldom knows much. The first question to be asked is always, does the remedy produce certain results, and then the next is why does it so act. As Harvey said, "Our first duty is to enquire whether a thing be or be not before asking wherefore it be."

"The pharmacologist," wrote the late Sir James Mackenzie, "may produce easily recognized reactions by the use of such drugs as castor oil and digitalis, but he does not know upon what structures these substances act." The late lamented Sir Clifford Allbutt was a noted empiricist, and in a letter to the *Lancet* published after his death—probably his last communication to medical literature—discussing the action of alkalies in irritable conditions of the skin and urinary tract, he lauded the use of sodium bicarbonate and said, "I offer to your readers no explanation, simply an empirical result," and the *Lancet* in commenting on this says, "He offers no explanation of the phenomenon but reports an empirical result, knowing that on the sum of such results explanation may follow. Throughout sixty-five years of professional work he always maintained a similar logical outlook."

Much has been said by my predecessors in this Chair about the patent medicine evil. As a member for the last fifteen years of the Advisory Board appointed under the Proprietary and Patent Medicine Act of Canada, I have had considerable experience as to what these preparations contain as all must pass the Board before being registered, and it is amazing to see what trash most of them are. And yet the enormous sale continues, largely due to much advertising. If the out-and-out patent medicines are a menace to the public health, even more insidious are those the sale of which is supposed to be pressed solely through the medical profession, samples of which, with their accompanying "literature" swamp our tables. On rare occasions one sees some preparation which may have some value but in most instances it would be better if they did not exist. They lead the practitioner away from the valuable habit

of prescription-writing in which the drug or drugs prescribed should be exactly adapted to the individual needs of the special case before him. The way in which glandular extracts have been foisted upon a too gullible profession is little short of a scandal. The use of most of these has gone far beyond any scientific support and as Swale Vincent says, "constitutes one of the worst forms of present day quackery."

The teaching of therapeutics in the medical schools is a subject that very closely concerns this Society, and Professor Osborne's paper on it, read here in 1921, was a masterpiece and has been a great help to many teachers. Sir George Newman in his Report on Medical Education in England of several years ago wrote, "The question naturally arises: how is the practical teaching of therapeutics best conducted for the medical student? In England the teaching of this subject is insufficiently organized unless under somewhat rare and exceptional conditions, but in certain schools in America, e.g. Columbia, Johns Hopkins, Pennsylvania, Yale and Toronto, it is admirably arranged in what are described as 'therapeutic clinics,' where the student himself witnesses the choice of suitable drugs or methods for the individual patient and later on may estimate the actual results of such treatment. These therapeutic clinics are charged with the responsibility of emphasizing the therapeutic problems of the disease under observation.... The student observes the effect of the drug on the patient, and keeps a card record of the results of such treatment from day to day; the therapeutic use of the drug rather than its pharmaceutical character becomes the point at issue; the system of the body and not the laboratory only is the sphere of action. Thus a new understanding of classification is founded on therapeutic use." In his last report of 1923 he speaks of much improvement having taken place in therapeutic teaching, but says truly that a great deal still is necessary.

The chief difficulty that we teachers have is the limited time that can be got in the present crowded course. Much is often said about the importance of various special measures, such as physiotherapy, electricity, massage, hydrotherapy, heliotherapy, and so on, and while everyone admits freely that these are important, the question always arises where is the time to

come from. All that at present can be done is to impress the student with the importance of these subjects, and give a few demonstrations of the methods. No one can become a skilled masseur or electrician from a few clinics. It simply cannot be done. All we can hope to do is to so interest him that he may follow out any of the special methods as a post-graduate study.

The use of a few drugs should be considered in detail. Out of the whole pharmacopœia there are wonderfully few that really matter and the actions of these can be well shown without undue loss of time.

It has always seemed to me that treatment may be most efficiently considered under certain headings. In the teaching of physical diagnosis the student is everywhere drilled to consider first inspection, next palpation, next percussion and finally auscultation, and many of us can recall the trouble we got into as students when if asked to examine a heart we commenced by applying the stethoscope. In the same way if treatment be considered systematically it lessens the chances of important points being missed. In Toronto the divisions that we employ are the following:—diagnosis, environment, diet, specific therapy, and lastly symptomatic treatment. In the case of any patient the question of diagnosis is of course first considered, and here come, naturally, all degrees of certainty and uncertainty, but although as yet the whole nature of the abnormality is not yet clear the patient requires treatment. It is pitiful sometimes to see a poor sufferer waiting day after day in hospital for some treatment and yet getting none because the exact character of his ailment is still in question. There are always some symptoms that can in the meantime be treated with advantage. I recall a well-known London physician who always insisted that his hospital patients whose disorders were not yet diagnosed should be put upon compound infusion of gentian, and there was much wisdom in his practice. Next, the environment. Does the patient require to be kept in bed; does he need skilled nursing; should friends be admitted; should he be quarantined? Here also comes the important question of the psychic surroundings, how much he should be told of his condition, and many other points relating to his physical and mental environment. Next the diet, both qualitatively and quantitatively. Then the

specific therapy which includes the removal of the cause where this is possible or the enhancing of the body tissues in their power to specially resist certain infections. The number of specific medicinal remedies is still small, including such drugs as quinine in malaria, arsenic and mercury in syphilis, emetin in dysentery, etc., but under the heading of specific treatment come vaccines and sera, many surgical operations such as the removal of a cancer; also emetics, gastric lavage or purgatives where some irritant or toxin lies in the alimentary tract and can be so removed with an immediate relief of the symptoms.

And lastly symptomatic treatment, which after all is still the chief field of medical practice; the physician merely controlling and lessening distressing or dangerous symptoms until the *vis medicatrix naturae* has time to act, if indeed it will act at all.

Symptomatic therapy is sometimes smiled at by the overwise, but it often does more than merely give relief, and it is a pleasure to read the view of such a prominent physiologist as Haldane who in discussing the use of oxygen says, "It may be argued that such measures as the administration of oxygen are at best only palliative, and of no use, since they do not remove the cause of the pathological condition. As a physiologist I cannot agree with this reasoning. The living body is no machine, but constantly tending to remain or to revert to the normal, and the respite afforded by such measures as the temporary administration of oxygen is not wasted but utilized for recuperation."

By the use of some such system as this the student, who is the practitioner of the future, learns to think of what he can do for his patient in an orderly manner and is then less apt to skip from diagnosis to medication and leave out what may be the most important part of the therapy which may lie in the environment, the diet or the removal of the cause of the ailment.

Prescription-writing is always rather a bugbear to the student and one is often impressed by the hiatus that exists between his knowledge of what should be prescribed and his ability to prescribe it. Hence he falls an easy prey to the stock prescription and likewise to the patent medicine man. The common custom in many hospitals of having ready-made mixtures for



various diseases or symptoms, these going under such names as *Mist. Stomachic.*, *Mist. Expect.* etc., or even by numbers, is a bad one for both students and house physicians. The Committee of One Hundred on a Standard Curriculum for Medical Colleges under the Council of Medical Education should have our entire sympathy when they reported that "Incalculable harm has been done by the common and convenient habit of writing prescriptions in hospital and dispensary practice by numbers instead of ingredients." Professor Stockman, of Glasgow, some years ago roundly condemned what he called "penny-in-the-slot practice" where a diagnosis called for a stock mixture, but the

custom appears to be as common as ever. Such routine practice leaves out of account altogether the individuality of the patient and is a death blow to any scientific therapy.

But time presses and I would close these rambling remarks by expressing the hope and firm belief that the American Therapeutic Society will continue to maintain its high standard of work and its firm belief that the chief aim of the practitioner of medicine should be the treatment of his patient. That ancient physician, Charaka, said over four thousand years ago, "That is the true medicine, and that the true physician that can cure and eradicate disease," and we of to-day can endorse his dictum.

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## An Address

### THE SUCCESSIVE STAGES IN THE CONTROL OF TUBERCULOSIS\*

EDWARD R. BALDWIN, M.D.

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THE sentiment which Canadian physicians have always held toward the work of Trudeau makes it all the more gratifying to appear before this audience and represent the institution and my colleagues in Saranac Lake on this occasion. The pioneers in any movement are often unappreciated, but among the first to understand the meaning and feel the importance of the sanatorium movement were Canadian physicians. It was not surprising therefore that an influential group of Canadian physicians became interested in the subject of tuberculosis and you began early an intelligent effort toward its control. It was indeed a matter of great satisfaction and pride to us to have had a succession of your able young men, themselves afflicted with the disease and recovered from it, who have been with us and have since devoted their lives to this work in their native country or elsewhere.

Their services have been conspicuous during

and since the Great War, and we may well say that they were providentially prepared for the need. It has ever been largely through the labours of those who have suffered, that the disease, tuberculosis, has been fought the world over, and in Canada the wise handling of the difficult problem of the tuberculous soldier has been notable because the government enlisted the services of men who had personal experience to guide them.

I am reminded of a parallel case in a wholly different sphere. Three young men, all naval architects, came under our care for serious lung disease at different times before the war. All recovered sufficiently to give distinguished service in ship-building during those strenuous years, all being men of unusual ability who undertook large responsibilities beyond the power of many in perfect health.

That insistent law that we call self-preservation doubtless had much to do with the first stage of man's struggle to do something against such a formidable enemy as tuberculosis. By this I mean that the leaders in the struggle had a personal stake to play for. They groped

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\*Public Address at the Twenty-fifth Annual Meeting of the Canadian Tuberculosis Association, Montreal, May 14, 1925.

about for means to restore their health; they sought the ideal climate, and to some extent the health resorts thereby became centres of study. Having found health in mountains, deserts and the balmy isles of the sea, the tendency to believe in the infallible virtues of certain climates was wide-spread. This stage of our knowledge prevailed especially during the nineteenth century and before the discovery of the bacillus. It was not a new idea, for the ancient Greek physicians believed in the efficacy of mountain air for pulmonary diseases. The era of bacteriology brought a gradual change, whereby the climatic influence was minimized and pushed into the background by the belief that a cure would soon be found to combat the germ of tuberculosis.

The intensive study of every possible method of producing immunity occupied the attention of medical and veterinary investigators from the time of Koch's discovery. We were led on by the hope of a quick conquest, yet those who saw beneath the surface realized that the extermination of tuberculosis required many-sided reforms. It meant a radical change in the habits of life, the housing of the people and their conditions of labour—often a physical and moral regeneration. During the early nineties the search for serums and tuberculins that would fortify the body against the bacillus was eagerly prosecuted. The new remedies followed each other in rapid succession, but were always soon abandoned. Some would kill the microbes; others neutralize the poisons; still others protect against them. None has proved wholly successful and most of the treatments were failures due to the half knowledge and false conceptions of their discoverers.

The brilliant successes of Pasteur in preventing rabies and anthrax, the serums against diphtheria by Behring and Roux, and of Wright in typhoid vaccination, were the natural foundations for the expectation of similar results in tuberculosis. Tuberculin was brought forward, the marvellously delicate agent for the detection of tuberculous infection and to a limited extent useful as a specific treatment; but its limitations were greater than Koch himself realized. Damaged lungs could not be made entirely new after destruction of tissue had taken place. Neither could a diseased knee-joint be made wholly flexible after a well-

seated tuberculosis had changed the normal lubricated surfaces into scar tissue. These things had to be remembered and disappointment was to have been foreseen. Nevertheless much has been won from our laboratory investigations during the past twenty-five years. The microscope and the x-ray have become invaluable and necessary in finding the earliest stages of the disease.

The unremitting, year-long experiments on the causation, ways of infection, and spread of the disease have brought rich rewards not always appreciated. The sanatorium and hospital care of those actually ill, the dispensary for the discharged and ambulant patients as well as for those under suspicion and requiring observation for diagnosis, have been extended widely, both in the States and in Canada. The sick and homeless consumptive is less often seen on the streets of our cities; he is being cared for. Great gains have followed these measures and we are forced to believe that the isolation and proper supervision of advanced cases has done much to reduce the amount of tuberculosis.

There was a stage in our campaign not many years ago when it was not of much use to discover a poor consumptive. There was no place to send him and his lot was pitiful, because he was feared as a leper. Fortunately this is becoming less true. There are still far too few well-conducted hospitals for the tuberculous, and patients fear to enter them.

The noteworthy decrease in the mortality from tuberculosis in the past twenty-five years has been variously accounted for. No unceremonious opinion is to be expressed, but the fact remains that, subtracting a liberal percentage as due to great economic advances and the decrease of other diseases, there is still a large saving of life to be attributed to the sanatoria and hospitals. The combination of the education of the patient and the simple hygienic care of the sputum has done much, in my opinion, to decrease the amount of infection even though it has not prevented it altogether.

When we survey the present tuberculosis situation, there are many encouraging things both in the United States and Canada. The mortality rate of 93.6 per 100,000 of population for the year 1923, as compared with 195.2 in 1900 in the United States, is an indication of

a decrease of more than half. You have done even better in Canada, with an approximate rate of 84.7 per 100,000, in 1923. Some statisticians tell us that we should reach the lower rate of 50 per 100,000 of population by 1930. I understand that your western provinces, Alberta, Saskatchewan and Manitoba are already in this fortunate position. New Zealand and Australia also have such low rates, and some people ask, why is this not perfection? What more should we expect? Possibly there is an irreducible minimum but it cannot be thought that no effort will be required when reached. Special attention should be given to the wide differences between the western provinces and your maritime provinces. In these latter the rates vary from 107 to 132, more than double those in the former. It is to be seen, therefore, that much is yet to be accomplished both in discovering the true causes of the differences and the energetic work of prevention.

Having passed through the successive stages of acquiring knowledge and organizing to combat the disease with measurable success, we find ourselves in the midst of an age of rapid scientific progress with plenty of problems in tuberculosis yet to be solved. We have been absorbed in educational propaganda to spread the knowledge already possessed. In your country, for example, there is much diversity of climate, in some respects most favourable for the invigoration of its inhabitants, in others an encouragement to indoor life owing to the long, severe winters. The prevalence of the disease under varying climatic conditions is worthy of much study; popular ideas on the subject in the foggy, wet coast of New Brunswick, Nova Scotia, and Prince Edward Island, would attribute the excess of tuberculosis mortality to the weather. A former patient of mine, a very observing and intelligent Catholic priest from New Brunswick, gave me another explanation quite as satisfactory though fundamentally an indictment of the climate. He noted the custom of the people along the shore towns of visiting each other during the winter and often remaining several days when the weather was bad. It was natural that visiting was not possible for the tuberculous sick. Nevertheless such tuberculous homes were visited by the healthy neighbours, including

their children, thus spreading the infection. Investigations into social conditions bring out facts like these of major value, and in the epidemiology of tuberculosis there is frequently found the key to adequate control in spite of unfavourable climatic conditions.

We have another problem for investigation, which might be termed a field laboratory problem; that of *occupation* in its relation to tuberculosis. Take the mining industry; in Canada this must be regarded as very important. Our experience in the States shows a serious hazard in the quartz and zinc mines, and especially in the stone-cutting trade among the granite workers. These men first acquire a fibrous change in their lungs, which is followed in time by the development of tuberculosis. The danger of this trade has led to special legislation in South Africa. There is necessarily little to be accomplished by laws without education and obedience, while indemnities are only palliative.

Tuberculosis is not a necessary evil, were we living under millennial conditions; yet in proportion as people are deprived of the comforts of life, or by vicious habits deprive themselves of good food, rest and sane living conditions, the disease continues in spite of education and sanitation.

We have always had a secret fatalism concerning tuberculosis. We instinctively have mental reservations when anyone mentions the probability of its cure or eradication. I believe this feeling is changing to one of optimism, of undue optimism it may be. Therein lies a danger, for if it be thought that the present outlook justifies the expectation of a startling discovery, such is not my belief. Only by persistent year-long studies by many workers may we at length be privileged to announce such a boon to sufferers. We need workers, even in the smaller laboratories. They may produce—indeed have produced—discoveries that have carried us far in medicine. No more illustrious example may be cited than your own country affords in Dr. Banting and his associates in Toronto.

There are resemblances between tuberculosis and leprosy that call for investigation and that may lead to important angles of view in our treatment. The *racial* differences in this disease are known to be considerable, especially

among the Indians and Esquimaux. So far, the best statistics are incomplete for lack of diagnosis and records of illness and death. We believe the ravages of tuberculosis among primitive races, however, certainly require that they shall be protected from contact with the infection to avoid their extermination, until some method of immunization may be discovered.

All these and many other avenues of useful effort, as I conceive it, lie open to the Canadian Association. You have been quick to introduce new methods, and the surveys of the tuberculosis population as well as the demonstration at Three Rivers now in progress betoken an understanding of their value.

The most hopeful tendency, to my mind, is in the direction of these systematic health examinations. They pay enormous dividends. Industry has been very careless of its human machinery in the past, but the future is to witness a change, if coöperation can be secured between employer and employee, such as now obtains in some industries.

The proper examination of large numbers of people for concealed tuberculosis, requires skilled judgment aided by good laboratory facilities, including x-ray equipment. These are not universally available, and so the people in isolated districts of Canada and the States must yet wait for the application of modern aids to diagnosis and treatment until they can be brought to their homes.

Great precision has been obtained in the use of the x-ray and by the systematic examination by older methods, combined with tests only possible in a laboratory with trained technicians. Fortunately, these facilities are increasingly available. With the knowledge now available it is possible in many instances to make a diagnosis of serious lung disease before any outward symptoms are manifest. We should not be satisfied until the machinery is created whereby anyone likely to become a victim of tuberculosis shall have the earliest possible diagnosis and supervision.

Experimental research is to be looked to for still greater gains, and the future refinements in the art of medicine are yet unmeasured. Civilization has brought tuberculosis, and more civilization and better is need to conquer it. It should be a source of great satisfaction that

Canada has at its command enlightened leadership, potential resources, and both medical and lay scientists who are capable of meeting these demands.

The final stage of our control of tuberculosis is already confronting us. I refer to the establishment of industrial colonies for the sheltered employment of tuberculous patients. A good beginning has been made in England and experiments are under way in New York. It is yet an unsolved problem what to do with persons unable to compete in the ordinary trades and occupations because of the quick relapse of the disease. The mistaken idea that they can take up vigorous open-air employment has not been wholly corrected. But few tuberculous persons who have had a serious amount of disease are fit for hard manual labour. They must be assisted therefore by furnishing them with easy jobs or with factory work under the same supervision that obtained while they were actually diseased. This problem touches the largest group now being treated in sanatoria, namely, the moderately advanced cases who have a fair chance for restoration of health, yet who must avoid over-strain later in order to retain it. This problem may be said to be in the experimental stage, and because of the tendency to advise such patients to seek a high and dry climate, there are difficulties in the way of establishing suitable industries elsewhere than in remote mountain regions far from the centres of population. The need is more pressing each year as more patients pass through institutional training. Their needs should not be lost sight of, but where possible they should be provided with some occupation, however unremunerative and restricted, to the great benefit of themselves and the community.

The successful operation of a scheme for after-care and employment means private or public philanthropy on a large scale, but it should be profitable, indirectly. I am aware that this is not a new thought to bring before you, for the excellent and considered recommendations of the Board of Tuberculosis Consultants to the Department of Soldiers, Civil Re-establishment, of which your president was chairman, dealt with the problem in a most comprehensive report in 1921. It will doubtless remain a difficult problem for many years in



the face of a diminishing amount of sickness and death from this disease. And so we can detect the outstanding needs of the present and future by the results already accomplished. Each step leads to another. First we must provide the means to discover all the frankly diseased people and cattle; then those who are simply harbouring latent and potential disease; lastly the search for the earliest evidence of infection before disease is established.

With such knowledge, coupled with a thorough education both of the patient and the community; with sufficient hospital and sanatorium facilities; with supervision of the patient when returned to his home or transferred to a more favourable climate, occupation or condition of work, we can hope with confidence to be ultimately free from the exhausting burdens of tuberculosis.

## EXTRACTIVES OF LIVER POSSESSING BLOOD PRESSURE REDUCING PROPERTIES\*

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KILLIAN and Kast<sup>1</sup> have shown that in eighty per cent of cases of internal carcinoma there is a definite increase of uric acid in the blood. Mann and Magath<sup>2</sup> report that in the hepatectomized dog the blood uric acid mounts steadily until death. It would therefore appear that there may be some definite relationship between deficient liver function or decreased internal liver secretion, and uricaemia. From an idea built on the observations contained in these two papers I began, in January, 1923, a study which culminated in an hypothesis, the main point in which was that the liver secreted some substance which played an important part in the regulation of blood uric acid, and that if such substance could be recovered, internal carcinoma might be controlled.

During the winter and summer of 1924, I prepared in my own laboratory many extracts of liver and tested their toxicity on dogs and cats. In October, 1924, I became associated with the laboratories of the University of Western Ontario Medical School, and collaborated with Dr. A. A. James and Dr. N. B. Laughton in a

research on carcinoma. To the staff of this university, and especially to Drs. McKibben, Crane, Macallum, James and Laughton I wish to express my appreciation for the facilities afforded, and for their encouragement and co-operation in my work.

In order that this liver extract might be tested clinically in carcinoma, and its potency tested in the reduction of blood uric acid in this condition, I asked Dr. James to make for me, according to my own formula, an extract from fresh calf liver. Three such batches were furnished, and two thoroughly tested clinically. In November I transferred the manufacture of these extracts to the experimental laboratories of a pharmaceutical house, and the clinical observations on carcinoma were continued. During December I noticed a steadily falling blood pressure in two cases in which the extract was being used daily, which observation together with the conclusions reached in a paper recently published by Fishberg<sup>3</sup>, led me to make my first clinical test on December 18, 1924, on a case of hypertension. Fishberg has shown that essential arterial hypertension is usually accompanied by high blood uric acid, and that there is frequently no tendency to subsequent retention of urea in the blood, and no development of uraemia. These cases with high blood uric acid content, are shown to suffer from the direct consequences

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of circulatory strain such as myocardial insufficiency. He believes that primary uricacidemia is the result of some metabolic change which is fundamental, and can only be controlled by the correction of this change in metabolism.

I was using a liver extract in an endeavour to reduce blood uric acid in carcinoma; Fishberg's paper dealt with hyperuricemia in hypertension; in two cases of carcinoma treated with the extract I noted a steadily falling blood pressure, and accordingly tried to reduce in hypertension the hyperuricemia I was trying to reduce in carcinoma. During the period in which I was working in the laboratory of Western Ontario Medical School I had conversation with Dr. James, in which the subject of the influence of liver extract on hypertension, artificially produced by epinephrin and other pressor substances, in experimental animals, was discussed. This related to previous work, hitherto unpublished, which had been carried on by Doctors James and Laughton since January, 1924. It is also well known that many workers, e.g. Fawcett, Rogers, Rahe and Beebe<sup>4</sup> in 1915, and Abel and Kubota<sup>5</sup> in 1919 used extracts of the liver, and other internal gland tissue extracts, to reduce blood pressure in experimental animals. I should like also to acknowledge indebtedness to F. P. Underhill<sup>6</sup> and Voegtlin and Bernheim<sup>7</sup> and others who by their experimental work have added greatly to our knowledge of blood pressure reduction in protein and other forms of shock. Finally to Dale and Laidlaw<sup>8</sup>, Barger and Dale<sup>9</sup> and Dale and Richards<sup>10</sup> and others who have studied the marked fall in blood pressure occasioned by the administration of histamine and cholin, I am under deep obligation.

When the first clinical test was made, the results obtained encouraged me to make further trial of the extract on another patient commencing on December 25th. Here also positive results were obtained.

Since these preliminary tests on the foregoing cases of hypertension were suggestive, I decided to use the material on individuals known to be suffering from persistent and long-standing arterial hypertension. The first cases presented no gross physiological or metabolic defects other than hypertension. Other patients subsequently treated were more critically studied with reference to associated disease phenomena. A dis-

cussion of this data will be presented in a clinical study now in preparation.

It is the purpose of this paper to report blood pressure observations on a series of normal rabbits and also on a series of cases of clinical arterial hypertension in which there has been a fall in both systolic and diastolic pressures, following the administration of certain extracts prepared from the liver. The laboratory observations are recorded in the tables in the text. In all, thirty-three clinical cases have been studied. The procedure of administration has been as follows:—A normal salt solution of the extracts of varying dosage was injected intravenously. In twenty-five cases the patients experienced no disagreeable symptoms, most of them reporting apparent relief of the unpleasant symptoms of hypertension. In eight cases there followed reactions of varying degree, some of which closely resembled protein shock, i.e.: chill, rise in temperature lasting several hours, nervousness, loss of appetite and weakness, together with a sharp fall in both systolic and diastolic pressures. Five of these reacting cases were studied in the Highland Hospital, Rochester, New York, with Dr. John R. Williams. In the cases free from symptoms one injection served to depress the blood pressure from one to three or more days, according to size of dosage. In all the favourable cases, the return to hypertension was gradual.

When the time came for testing this substance clinically I did the first series of cases in St. Catharines. Dr. J. H. Mullin, with his well-known executive ability and indefatigable energy, has had charge of the clinical work in Hamilton, and assisted me in arranging the work there, supplying the first series of cases in that city. This work under Dr. Mullin's direction was carried out by Dr. Tice whose observations at regular intervals enabled us to add much to our knowledge of the subject. Since it appeared that this extract, by this time made from fresh calf liver, might contain an active principle of value in the reduction of arterial hypertension, arrangements were made with the McGregor-Mowbray Clinic to place at my disposal their research laboratory. To Dr. McGregor and to Dr. Mowbray I wish to express my most sincere gratitude for the interest they have taken in this work in thus placing at my disposal their full research facilities includ-

ing their biochemist Mr. W. M. McDonald who succeeded early in February in recovering from the extract what appeared to be the active principle in two fractions which we termed elements "A" and "B".

While we were working with the original extract and the two active elements, the clinical work was carried on by Doctors Mullin, Tice, Park, McGhie, Pain and Farmer of Hamilton,

Dr. Bertram of Dundas, and myself in St. Catharines.

About the first of April I received from Dr. John R. Williams of Rochester, N.Y., an invitation to treat a series of his patients in the Highland Hospital in that city, and I accordingly spent several days with him. He made the clinical investigation himself. He took all the pressure readings and made all the observations.

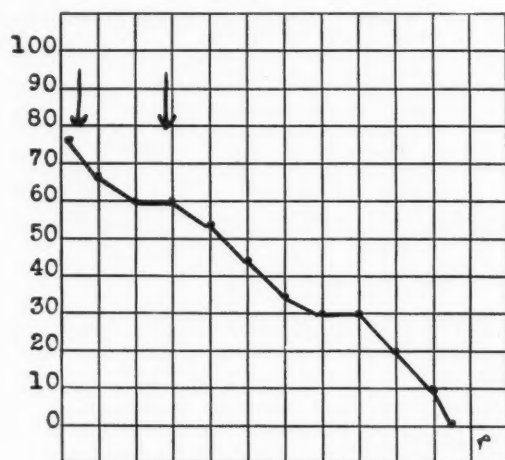


FIG. 1.—Rabbit No. 10. Weight, 1300 grms. Date, April 18, 1925. Time of injection 9.27 a.m.—"A" 0.5 cc.; 10.00 a.m.—"A" 0.5 cc. Died 11.43 a.m. Anaesthetic—urethane 25 per cent., 5 cc. per kilo body weight. Ordinates represent blood pressure.

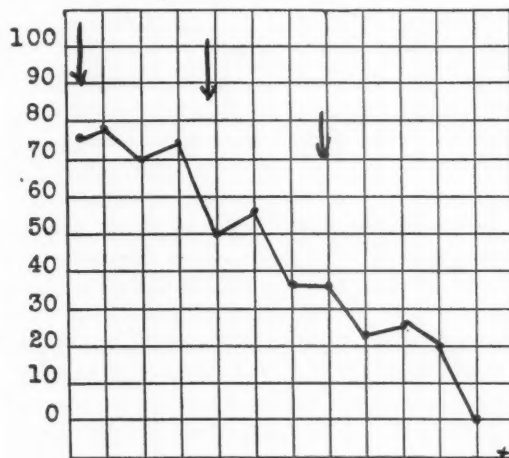


FIG. 3.—Rabbit No. 14. Weight, 1250 grms. Date, April 21, 1925. Time of injection, 9.45 a.m.—"A" 1 cc.; 10.45 a.m.—"A" 1 cc.; 11.45 a.m.—"A" 1 cc. Died 1.50 p.m. Anaesthetic—urethane 25 per cent., 5 cc. per kilo body weight. Ordinates represent blood pressure.

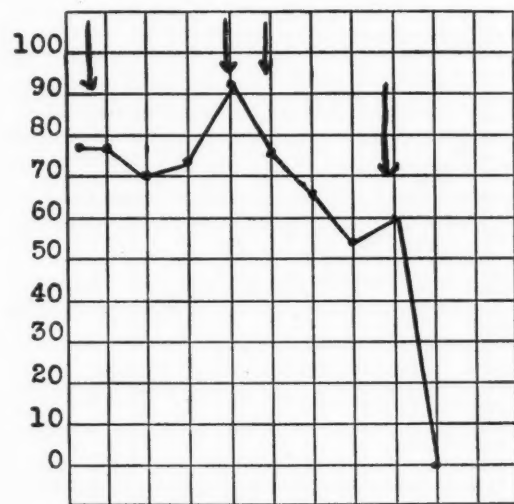


FIG. 2.—Rabbit No. 12. Weight, 1240 grms. Date, April 20, 1925. Time of injection 12.00 noon—"A" 1 cc.; 2.25 p.m.—"A" 1 cc.; 3.08 p.m.—"A" 1 cc. "B" 1 cc.; 6.00 p.m.—"A" 1 cc. "B" 1 cc. Died 6.50 p.m. Anaesthetic—urethane 25 per cent., 5 cc. per kilo body weight. Ordinates represent blood pressure.

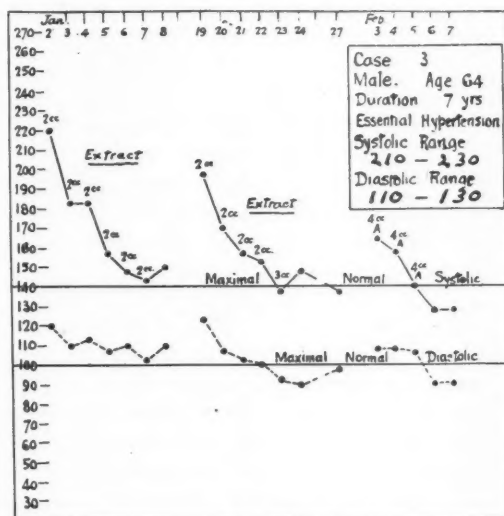


FIG. 4.—Case 3. Physician—Hemiplegia in 1918 and again in 1919. Record of treatment with liver extract. Ordinates represent blood pressure. Abscissae days on which injections were given. Between each series of treatments the pressure gradually rose, but not to the former level.

In the early stage of the clinical investigation Dr. M. J. Mulock of St. Catharines presented himself as a patient, and by so doing has probably advanced our work to an equal degree with any of the others. I further wish to again thank Mr. F. F. Dalley of Hamilton, who at an early stage, by supplying funds for the purchase of equipment, supplies and honoraria for several workers, made this experimental work possible.

To the various gentlemen named I wish to acknowledge my most sincere gratitude for their co-operation in this work.

A summary of kymographic records of the variations of blood pressure in the carotid artery taken by the Brodie method in twenty-eight rabbits treated by one or more intravenous injections of either element "A" or element "B" alone or combined, shows the following. Control animals were used in almost all experiments.

**Group A.**—In twenty-one rabbits the pressure was reduced to zero and the animal died. The average pressure at the commencement of the record was 76.90 mm. and the average length of time before death was two hours and ten minutes.

**Group B.**—In five cases there was an average fall of 34.80 mm., the average pressure at commencement being 105.20 mm. and in three hours and forty minutes 70.40 mm.

**Group C.**—In two cases there was no appreciable alteration. There was a slight primary

fall which quickly recovered and in an average of three hours and ten minutes the pressures averaged the same as at commencement, 95 mm.

Clinical observations on thirty-three cases of hypertension treated since December 18, 1924, with liver extract.

1. Total number of cases observed..	33
2. Range of age of patients.....	42-67 years
3. Average age.....	61
4. Average known duration of hypertension in years.....	6
5. Average range of systolic pressure before injection....	204 mm.
6. Average range of systolic pressure after injection.....	142 mm.
7. Average fall in systolic pressure .....	62 mm.
8. Average range of diastolic pressure before injection....	114 mm.
9. Average range of diastolic pressure after injection.....	86 mm.
10. Average fall in diastolic pressure .....	28 mm.
11. Cases where no reactions occurred .....	25
12. Number of cases experiencing reaction .....	8

There were no reactions with the use of the original extract, but in the eight cases where the reaction did occur it was when the two elements "A" and "B" had been combined in one injection.

**Comment.**—The chemical nature of these liver extracts has not yet been ascertained, but our experiments indicate that the active material is not a protein. It would therefore appear that these extracts possess some specific quality which exerts a definite depressor effect upon normal

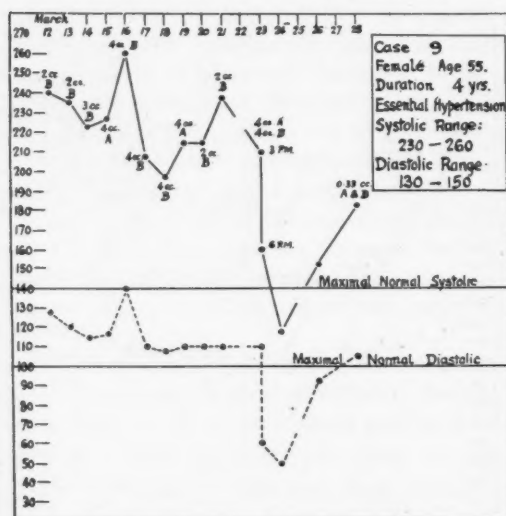


FIG. 5.—Case 9. March 12-19, 1925, no appreciable effect produced by either A or B given separately. A and B then given combined, followed by a precipitous fall in three hours, and a further steady fall for the next twenty-four hours in both systolic and diastolic pressures.

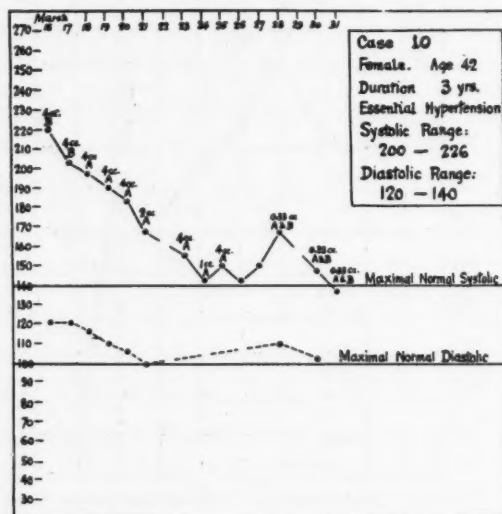


FIG. 6.—Case 10. Hemiplegia in 1922. All treatments given subcutaneously. March 22-27 diastolic pressure hard to read. Now maintains normal pressure on two injections a week.



blood pressure in animals and marked hypertension in man.

The investigation of the chemical qualities of these extracts, as well as certain important ancillary problems is in progress in the Department of Physiology and the Connaught Laboratories, University of Toronto.

The preliminary observations included in this paper are presented for consideration *without conclusions or deductions* pending further investigation by myself and other workers, both in the laboratory and in the clinical field.

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## THE CONTROL OF BLOOD PRESSURE WITH LIVER EXTRACTS

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PREVIOUS observations by Dakin<sup>1</sup> and others on the absorption of pressor bases and other such substances through the intestinal walls and the influence of the liver in destroying these toxic agents led to the deduction that possibly the liver contained a substance which might be extracted or separated and used to control blood pressure. With these ideas in view the present work was begun in January, 1924.

At first a simple saline extract of the liver tissue which was frozen and thawed two or three times and rendered biuret free by treatment with alcohol, was used. Since then the preparation has been greatly modified. Livers from the rabbit, dog, beef, calf and pig were used.

In the experiments in blood pressure, rabbits were used. Some records on dogs were also obtained. The blood pressure was recorded by the direct method from the carotid artery. A cannula inserted into the external jugular vein served for the injection of the extract. Both urethane and ether were used separately as anaesthetics.

The normal blood pressure was noted on the tracing, then 1 cc. of 1 in 10,000 epinephrin was given intravenously. The typical abrupt and sustained blood pressure curve was observed. When equilibrium was reached the same dosage

of epinephrin was repeated and this was followed immediately by 1 or 2 cc. of the liver extract. Immediately the blood pressure began to fall quite rapidly until a normal or sub-normal level was reached. The period of fall was about one tenth the time usually consumed following an injection of adrenalin alone.

When the liver extract and epinephrin were mixed in the proportion of 1:1 there was usually a slight but unsustained rise in blood pressure, equilibrium being reached in a few seconds.

In addition to epinephrin, pituitrin and the two pressor bases isoamylamine and parahydroxyphenylethylamine were used to induce a hypertension. We found here, too, that the liver extract was antagonistic in its action towards them.

The degree of effect on the blood pressure seems dependent on the dosage and on the strength of the extract. By giving a suitable dosage to a normal rabbit the animal will first appear weak, then fall on its side, become blanched and if sufficient has been given, will die in a minute or two, without convulsions. At autopsy the heart and lungs appear normal and the blood seems to have collected in the large vessels.

In rabbits anaesthetized with urethane, no

pressor substance having been given, the fall in blood pressure and the duration of fall as shown by kymographic records, varies with the dosage of the extracts. We were able, with one dose, to keep the blood pressure practically constant at about 50 mm. Hg. over prolonged periods. The normal blood pressure in these animals was 100-110 mm. Hg. It is possible to reduce the blood pressure temporarily to 15-20 mm. Hg. but if the pressure remains much below 50 mm. Hg. for long the animals die.



FIG. 1.—Record of the blood pressure on a rabbit following an injection of 2 cc. of the preparation from the beef liver.

The exact chemical nature of the compound is still unknown. No tests for histamine can be obtained and its physiological action seems to be quite different. Preliminary experiments strongly suggest that it is not choline and that it is much more potent.

### Conclusions

1.—Extracts of liver used in experimental animals effectually reduce the hypertension induced by certain pressor substances.

2.—These extracts will reduce normal blood pressure to a low level (about 50 mm. Hg.) where it is maintained over long periods of time.

3.—Large doses reduce the blood pressure to its lowest level and death ensues.

4.—Preliminary work suggests strongly that the active substance is not choline or histamine.

### Note

This communication is a preliminary report and further details as to the chemistry and physiology of this anti-pressor substance will appear later.

We wish to express our appreciation to Prof. A. Bruce Macallum for his helpful criticisms and suggestions.

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**Unusual Complication Following Usual Operative Procedure for Varicose Veins.**—Two cases are cited by David Fisher and Edmund H. Mensing, Milwaukee, which emphasize and strike home vividly the extreme importance of a careful investigation in so self-evident a condition as varicose veins. In one of the cases the man had been advised to have an operation for varicose veins before an ulcer developed. The physical examination was negative except for the extremities, which showed marked prominence and slight bulging of all the superficial veins, extending from both feet upward to a point about 8 cm. above Poupart's ligament. There was very little tortuosity. The leg was raised and drained of its blood; then constriction was applied to the saphenous opening, and the leg lowered. Even after ten minutes, the veins did not show any filling. This, of course, meant that the deep or perforating veins were thrombosed or varicosed. In view of a history

of typhoid, it was safe to assume that in this case the deep or perforating veins were thrombosed, preventing the filling of the superficial veins. Had this man be operated on, gangrene of the extremities would probably have resulted. In the second case an ill advised operation was followed by gangrene necessitating a mid thigh amputation. An entire extremity was sacrificed, not to mention the physical suffering in the interim, because of the failure in the first place to apply a very simple test to the circulation. The authors urge that in every case of varicose veins, the Trendelenburg test be applied to ascertain the condition of both the superficial and deep veins; and in case of doubt, when the collateral circulation extends above Poupart's ligament, and no intra-abdominal cause for venous obstruction exists, the deep veins should be suspected.—*Jour. Am. Med. Ass.*, March 7, 1925.

## BACTERIAL PHAGOCYTOSIS BY THE EPITHELIAL CELLS OF THE CONJUNCTIVA\*

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AT the end of the third or fourth day of a gonorrhœal ophthalmia, the clinical signs are well established; chemosis is marked; discharge is profuse. Examination of the discharge in the ordinary way at this time may show a few gonococci in the pus cells, but more likely no micro-organisms will be found. If a smear is now made so the large pavement epithelial cells of the bulbar conjunctiva may be shown, large numbers of gonococci will be found on the cell surface with a concentration of bacteria at the cell borders (Figure 1).

Further examination will show that the gonococci have penetrated the epithelial cover at the cellular interstices. Exudation of serum and pus cells is now rapidly increasing, but in spite of this gonococci continue to work inward, and, by the end of a week or ten days, the inflammation being at its height, numerous epithelial cells become detached. Ectotoxins are now generated by the increasing numbers of bacteria, and diffuse directly into the conjunctival structures beneath, causing a dissolution of the protoplasmic cement substance, with consequent breaks in the superficial epithelial cell layer. The more virulent the toxins, the greater and more rapid the cellular proliferation as shown by the numerous multi-nucleated cells. The ectotoxins also produce a subconjunctival hyperæmia and œdema, and as soon as the cement substance starts to break down, serum is discharged through the conjunctiva. With this, there occurs an œdema of the conjunctiva which increases the separation of the cells and cell layers. (Lindner).

Early in the process of proliferation of the deeper epithelial cells, and the outpouring of exudate, the superficial cells are removed in patches. As the proliferation continues, layer after layer is cast off until the conjunctiva is composed of

entirely new cells. In some cases the proliferation takes place more rapidly than does the exfoliation so that within a few days the conjunctiva may be twice as thick as normal. This causes a well known clinical picture with the conjunctiva so thickened that it is impossible to evert the lids. Micro-organisms seldom penetrate as deeply as the epithelial layer owing to the different forms of resistance met with. The gonococci that penetrate the conjunctiva are firmly attached as parasites to the walls of their hosts, otherwise they would be quickly thrown back by the outpouring exudates (Figure 2).

As soon as they have penetrated to the second or third layer, by which time active proliferation of the deeper cells is taking place (through the stimulation of ectotoxins), the micro-organisms are confronted by a new resistance.

If a smear is now prepared so that the conjunctival epithelial cells may be examined, gonococci in large numbers will be found within the cytoplasm of the cells. That is, the new or young epithelial cells now begin to phagocytose the bacteria (Figure 3).

This begins at about the height of the clinical symptoms and lasts a varying period in the different forms of infection. In pneumococcus conjunctivitis it begins about the second or third day, and lasts about twenty-four hours. In ophthalmias of the new born the process lasts much longer and is very active.

The young epithelial cells not only phagocytose the micro-organisms, but begin immediately to digest them as the leucocytes do. The process of phagocytosis probably lasts until all the micro-organisms have been disposed of, and in gonorrhœal infections this may take weeks.

The following case shows how long gonococci may remain as parasites on the conjunctival epithelial cells:—

\*Read at the Meeting of The American Association of Pathologists and Bacteriologists, Washington, May, 1925.



FIGURE 1.—Photograph of drawing from slide showing gonococci collected at the cell borders.

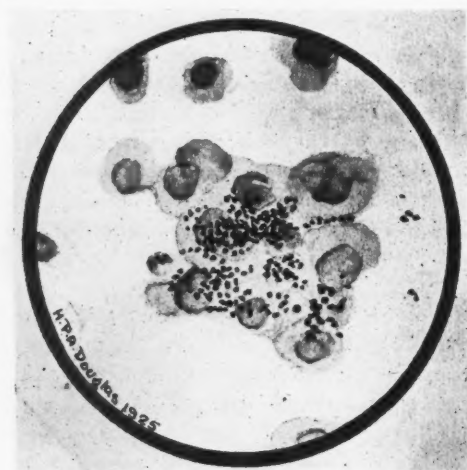


FIGURE 2.—Photograph of drawing from slide showing gonococci as parasites on the epithelial cells.

An adult male was admitted to the hospital on January 2nd, 1924, with a gonorrhœal ophthalmia on the right side. He was treated constantly in the routine way, and for some days had 2 per cent. silver nitrate. On February 6th, i.e., the thirty-fifth day of treatment, he was ready to leave the hospital. Discharge had ceased some days previously, and examination for gonococci proved negative. I now made a smear of epithelial cells, and stained with Giemsa, and was surprised to find num-

bers of cells with gonococci in them. The conjunctiva was then wiped dry, and with a stiff platinum wire the conjunctiva was firmly rubbed so as to obtain epithelium, and the material put on two tubes of hydrocele agar. A beautiful, pure growth of gonococci was obtained in each tube.

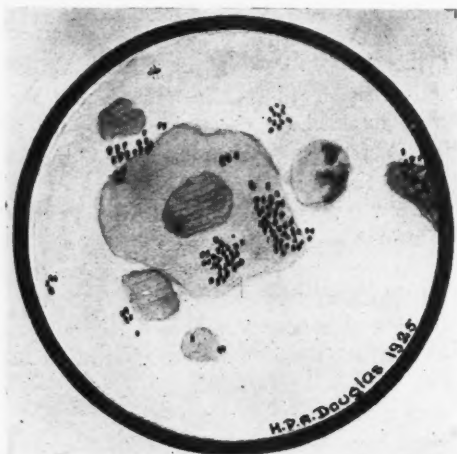


FIGURE 3.—Photograph of drawing from slide showing epithelial cell that has phagocytosed numerous gonococci.

Metchnikoff classified phagocytes into "mobile" (leucocytes, lymphocytes, and other cells existing in the blood) and "fixed," (certain connective tissue, and endothelial cells) (Howard). To this we must add phagocytosis by ectodermal cells as a regular process. That it takes place in other mucous membranes than the conjunctiva is certain, as I have observed it in the urethra many times. To the different forms of resistance to bacterial invasion of the conjunctiva, namely, the early casting off of the superficial epithelial layers, with their masses of micro-organisms, the outpouring of exudates, phagocytosis by leucocytes and acquired immunity, we must add another very definite line of defence, namely, bacterial phagocytosis by the conjunctival epithelial cells.

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## THE MORBID ANATOMY OF RHEUMATIC FEVER

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DURING the past few years our conception of rheumatic fever has changed very considerably. At first, attention was focussed entirely on the joints. As far back as 1828 Trousseau recognized the association of cardiac lesions with rheumatism, but it is only within recent years that constant microscopic lesions have been described. Aschoff was the first to describe the typical lesions of rheumatic fever, the so-called Aschoff body found in the myocardium. In reviewing the English literature on the subject Carey Coombes (1911) is apparently the first one to note the occurrence of constant pathological findings in all rheumatic lesions; namely, the Aschoff bodies in the subcutaneous rheumatic nodules and in the synovial membrane of the affected joints, as well as in the heart and aorta.

The Aschoff body is an oval submiliary tubercle, which is visible under the myocardium, perivascular in its distribution, and closely resembles the miliary tubercle of tuberculosis. It consists of three types of cells arranged more or less concentrically: (1) the endothelial cell; (2) the lymphocyte; (3) the giant cell. The essential element is the giant cell which is quite different to that found in tuberculosis. In acute lesions polymorphonuclear leucocytes are also found. This, then, is the typical rheumatic lesion.

In discussing the pathology of acute rheumatic fever we must recognize that there are two main types of lesion, the exudative and the proliferative. It is the exudative, marked by an outpouring of serum which naturally attracts the attention of the clinician, for it is responsible for the pain and swelling of the joints. The really basic and essential lesion, however, is the proliferative, as represented by the Aschoff body. If the exudate lesion disappears as a result of salicylates and the proliferative lesions in heart and aorta persist, the patient can in no way be regarded as cured of the disease.

Despite the increase in knowledge of the morbid anatomy of rheumatic fever little can be found in the subject in our text-books of medicine and pathology. In Osler's text-book of medicine there is no description of the histology of rheumatic fever elsewhere than in the myocardium. The case about to be described illustrates in a striking manner the characteristic lesions in a variety of tissues.

*History.*—The patient was a boy of eighteen, who was admitted complaining of dyspnoea, cough, pain over the præcordium, and pain and swelling in the elbow, knee and ankle joints. The condition was evidently one of acute rheumatic fever. He had had two previous attacks, one seven, the other one year ago, after each of which he suffered from cardiac symptoms. During the present attack cardiac pain and symptoms of heart failure have been much more pronounced.

Physical examination showed a greatly increased area of cardiac dullness, a diffuse apex beat, and a tumultuous and very irregular heart with a loud mitral systolic murmur. The dyspnoea and oedema rapidly increased, and the patient died two days after admission.

*Autopsy findings.*—Numerous small white-centred lesions surrounded by a red zone were scattered over the upper arm and chest wall. The pericardial sac was completely obliterated by firm fibrous adhesions. The pericardium was markedly thickened, and over an area of 10 cm. in diameter the apex was firmly attached to the anterior chest wall and diaphragm. The heart was markedly dilated and hypertrophied, weighing 850 grams, and was soft and flabby. The left auricle was thickened. The mitral ring was tremendously dilated, admitting the whole hand. Along the auricular edge of the valve was ranged a row of small pin-point vegetations. The interventricular septum and surrounding endocardium presented small, flat, slightly raised white plaques, about the size of a pin's head. The aortic valve presented the

same fine vegetations described above. The aorta showed no macroscopic lesion. The coronaries were patent. The liver showed well marked evidence of venous congestion.

*Microscopic examination.*—In the myocardium of the left ventricle the muscle fibres were separated at frequent intervals by fibrous bands containing the typical Aschoff bodies previously described (Fig. 1). The same lesions were found in the mitral valve (Fig. 2), but here the arrangement was not quite so characteristic because of the lack of vascu-

larity of the cusps. The cellular collections, however, consisted of the three typical cells, the giant cells, endothelial cells, and lymphocytes. In the aorta the changes were present in the outer part of the media, and the adventitia (Fig. 3). Here also the perivascular arrangement of the Aschoff cells was observed, but the lesion took the form of cellular bands rather than oval bodies. The elastic laminae were fragmented and the adventitia thickened. The similarity of this lesion to that of syphilis is apparent, and the possibility that rheumatism may be an occasional cause of aneurism

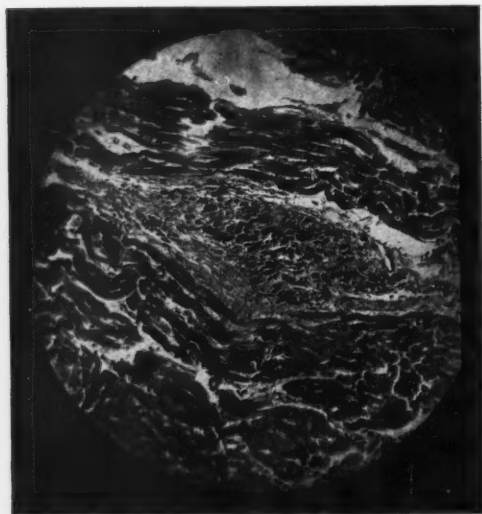


FIG. I.—Aschoff body in wall of left ventricle. The shape is highly characteristic.

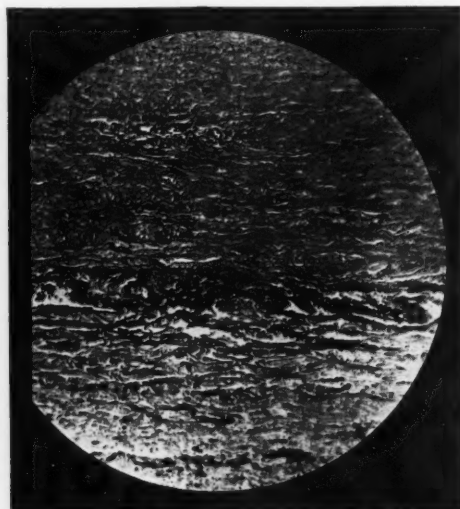


FIG. III.—Lesions in the outer layers of the aorta.

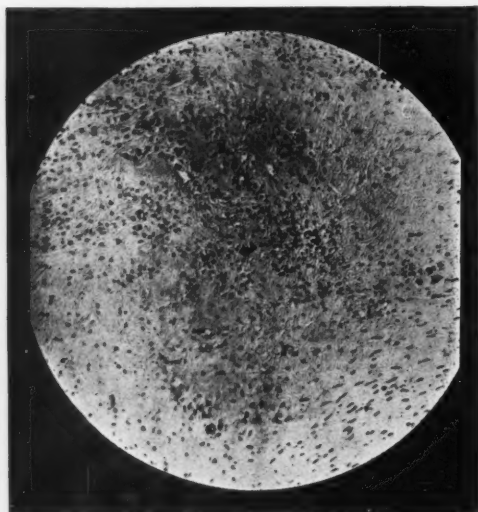


FIG. II.—More diffuse lesions in the mitral valve.

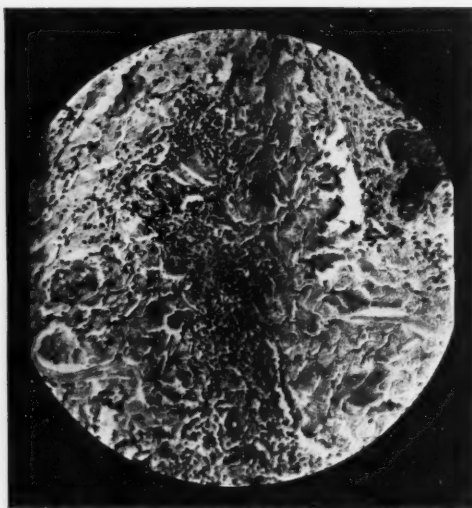


FIG. IV.—Aschoff body in skin lesions.

of the aorta must be taken into consideration.

In the synovial membrane of the affected joints cellular collections were found, but no very typical Aschoff bodies could be demonstrated. The subcutaneous nodules previously mentioned showed numerous Aschoff bodies beneath an ulcerated skin surface (Fig. 4). In these nodules, however, there were numerous polymorphs present.

We have since had another case of rheumatic fever in a child of four years, who gave only a very indefinite history of pain in the legs, but in whom there were advanced cardiac lesions. She died of heart failure shortly after admission, and the autopsy again revealed a large heart, showing pericarditis and mitral stenosis, with vegetations along the mitral cusps, and to a lesser degree on the aortic cusps. Again Aschoff bodies were present in the myocardium of the left ventricle, and in the left auricle, the mitral valve, and thoracic aorta.

**Summary.**—Acute rheumatic fever presents a typical histological picture by which the lesions can be recognized, whether they occur

in the vascular system, the joints, or the skin. It is a generalized disease of the cardio-vascular system, striking chiefly the heart and the aorta, in which the joint lesions play only a subsidiary part. The exudative lesion in the joints is a minor factor, as evidenced by both our cases, in which the joints had practically returned to normal, while the proliferative lesions advanced, and finally proved fatal.

I wish to express my indebtedness to Dr. William Boyd for his kind assistance in the preparation of this paper, and for providing the microphotographs.

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**Supervision of Summer Camps.**—With the growth of the so-called fresh-air movement, numerous camps have been established in the country to provide a brief vacation for the children of the city. A survey made by the Committee disclosed the fact that there was no adequate health supervision of these camps on the part of local or state health authorities. A communication to this effect was sent to the State Department of Health with a recommendation that the Sanitary Code be amended to afford protection to these camps similar to that which has been given in the past to labour camps. This recommendation was favourably acted upon by the Public Health Council of the Department on May 15, 1924.—New York Academy of Medicine, Public Health Committee Report, 1924.

**Accidents.**—Among the causes of death, those resulting from accidents are annually becoming of greater importance, both in actual

numbers and in relative importance. The automobile is the greatest offender in this respect. Statistics of highway accidents in New York City from the Police Department records show that the total vehicular accidents in three years from 1921 to 1923 increased from 26,890 to 32,885, or 22.3 per cent., and according to the State Department of Health the mortality rate from automobile accidents in the state rose from 10.2 in 1917 to 15.9 in 1923.

A table prepared by the National Bureau of Casualty and Surety Underwriters and published by the Metropolitan Life Insurance Company indicates that in some cities the hazard from automobile accidents is several times greater than in others as measured by death rates per 1,000 automobiles registered. New York City stands next to the highest in the rate of life destruction.—New York Academy of Medicine, Public Health Committee Report, 1924.

## ACUTE SEPTIC TRACHEITIS\*

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THE term acute septic tracheitis has been used to describe the condition in the following cases. No cases appear to have been recorded under this heading, but undoubtedly they are to be found in the literature under some other title.

The patients were all admitted to the Hospital for Sick Children during the last year. They were all fatal and came to autopsy.

*Case 1.*—F. B., male, age nine years. Admitted March 17, 1924. *Complaints:* Difficulty in breathing, hoarseness, and fever which had come on twenty-four hours before.

*Past history.*—The patient had been in the hospital from October, 1923, to March, 1924, with a fractured pelvis and diphtheritic otitis media. On leaving the hospital the aural discharge was positive for Klebs-Löffler bacilli but negative for virulence.

*Present illness.*—The child was quite well until March 16, 1924, when some difficulty in breathing was noticed. This became gradually worse and the child became hoarse and feverish. He was thought to have laryngeal diphtheria, and was sent to hospital the following morning.

*Examination on admission.*—Temperature 102°. The patient was a well developed and nourished male child of nine years. He was rather pale and markedly dyspnoeic. The mucosa of nose, mouth, and pharynx was apparently normal. The tonsils had been removed. The rate of respiration was forty-eight per minute. There was marked intercostal and substernal indrawing. The air entry was insufficient, especially on the right side posteriorly. The breath sounds were subdued and somewhat bronchial but clear, there were no adventitious sounds and no areas of dullness. Other systems were normal.

*Laboratory report.*—Red blood corpuscles 5,350,000; white blood corpuscles 21,000; polymorphs 75%. *Laryngoscopic examination:* The mucosa of the larynx appeared normal, the vocal cords pale, slightly edematous and partially obscured by greenish crusts. Just below the true cords and as far as could be seen, the trachea appeared to be lined with a greenish gray exudate. A direct swab of the tracheal exudate was negative for Klebs-Löffler bacilli.

*Progress.*—March 18, temperature 102°. In spite of treatment (steam tent, sedatives, etc.) the dyspnoea steadily progressed and he became unconscious at 7.15 a.m. At 7.30 a.m. a tracheotomy was done with rapid relief of the dyspnoea and return to consciousness. (Intubation had given no relief). He subsequently coughed considerably, expelling yellowish brown semi-fluid material from the tracheotomy tube. 11 p.m. There was some difficulty in keeping the tube clean. The inner tube was cleaned repeatedly and the outer tube changed once. A fairly good night was reported. March 19, 7 p.m. Condition was considered satisfactory, but about fifteen minutes later, although the airway was free he suddenly collapsed.

*Bacteriological report.*—Culture from the trachea, *Staphylococcus aureus* and *Streptococcus hemolyticus*.

*Autopsy report (synopsis).*—*Larynx:* The mucosa appeared apparently normal. The vocal cords were grayish pink and slightly swollen. *Trachea:* The mucosa, after a thin greenish gray pseudo-membrane was wiped away,

appeared red in colour. This superficial ulceration commenced just below the vocal cords and continued down the trachea into the bronchi. The colour of the mucosa of the lower end of the trachea did not appear to be so deep a red as that above. At the bifurcation of the trachea was a mass of very large soft red glands. There were many enlarged glands noticed along the trachea and large bronchi. *Lungs:* On section pus exuded from the bronchioles. Areas of consolidation were present in the lower lobes, and there was a large area of consolidation at the left base.

*Microscopic report (synopsis).*—*Trachea:* The lining cells were broken up and were necrosed in places. Beneath this layer was a marked infiltration of polymorphs and lymphocytes. *Lungs:* Bronchiolitis and broncho-pneumonia.

*Case 2.*—A. M., male, age four years. Admitted January 28, 1925. *Complaints:* Hoarseness for twenty-four hours, difficulty in breathing and fever for eighteen hours, and drowsiness for four hours.

*Past history.*—Subject to croup in cold weather.



*Present illness.*—The patient was apparently in good health until January 27, 1925. Towards evening he was noticed to be hoarse and during the night he was very hoarse, feverish, and breathed with some difficulty. This state persisted until about noon on January 28, when he became drowsy. A tentative diagnosis of diphtheritic laryngitis was made and he was sent into the hospital.

*Examination on admission.*—Temperature, 104°; pulse, 160. This patient was a well developed and well nourished boy of four years. He was very restless and a marked dyspnoea was present. The mucosa of the

\*Read before the Section of Ophthalmology and Laryngology of the Academy of Medicine, Toronto, 9th March, 1925.



mouth, pharynx and nose appeared normal. The tonsils were of moderate size and not inflamed. There was marked supra- and infra-sternal indrawing. Phonation was good though he was hoarse. The breath sounds were harsh, but there was no impaired resonance. A few scattered râles were heard on both sides.

**Laryngoscopic examination.**—The mucosa of the larynx was not inflamed, the vocal cords appeared normal. Beginning just below the cords, the trachea appeared to be lined by a greenish gray exudate. Because of the marked dyspnoea, tracheotomy was done with immediate relief.

**Bacteriological report.**—Direct smear from trachea exudate was negative for Klebs-Löffler bacilli. **Progress:** January 29. The child was reported to have spent a fairly comfortable night under a steam tent. During the day and night of January 29 and 30 the tube had to be cleaned very frequently. Child was very toxic looking. January 30: In spite of repeated cleaning of the lower trachea and bronchi by suction the boy died.

**Bacteriological report.**—Culture from trachea *Bacillus influenzae*, *Staphylococcus aureus* and *Streptococcus hemolyticus*. Culture from bronchus, *Bacillus influenzae* predominated.

**Autopsy report (synopsis).** **Larynx:** The mucosa and the vocal cords appeared normal. **Trachea:** Immediately below the vocal cords the mucosa was roughened and covered with a thin, grayish red, pseudo-membranous exudate. This continued down into the bronchi. On removal of the exudate the mucosa appeared red and raw, especially so just below the cords, gradually becoming less intense down the trachea. The right bronchus was partially occluded near its entrance by a firm reddish black mass. The left bronchus was almost completely filled with very tenacious yellowish green exudate. **Lungs:** Right, the upper and middle lobes appeared normal. The lower half of the lower lobe had a pyramidal area of consolidation of grayish red mottled appearance on section. Left, the changes were very similar to those noted in the right lung. There was a large mass of red soft glands at the bifurcation of the trachea and the glands along the trachea and bronchi were enlarged.

**Case 3.**—G. A., male, age two years. Admitted February 13, 1925. **Complaints:** Intermittent dyspnoea and fever for forty-eight hours.

**Past history.**—Measles and otitis media, not recently.

**Present illness.**—On the evening of February 11th the child developed a slight croupy cough. About 6 a.m. on February 12th he had some difficulty in breathing which steam relieved. During the morning he was feverish and refused food, again the difficulty in breathing was noticed. During the afternoon the dyspnoea became very marked. He was thought to have laryngeal diphtheria, and was given 40,000 units of antitoxin and admitted to the Isolation Hospital.

**Examination on admission.**—Temperature 100°. The patient was a well developed and well nourished boy of two years. He was restless, and marked inspiratory difficulty was noted. His skin was livid. His voice was not lost. He appeared very toxic. The mucosa of the mouth, pharynx, and nose appeared normal. The tonsils were of moderate size, but not inflamed. There was marked supra- and infra-sternal indrawing. **Lungs:** The air entry was poor. The lungs were resonant throughout. There were a few scattered râles at the base. Other systems were normal. Intubation was performed but gave no relief.

**Progress.**—The child was placed under a steam tent and given Codeia gr. ½. Gradually the dyspnoea subsided and he passed a comfortable night.

February 13th.—**Laryngoscopic examination:** Larynx, the mucosa appeared normal. The vocal cords were grayish pink and oedematous; beginning just below the cords the trachea appeared to be lined by a thick greenish gray exudate. No membrane was seen.

**Bacteriological report.**—Swab of trachea was negative for Klebs-Löffler bacilli. He was transferred to the Hospital for Sick Children at 7.30 p.m.

**Examination on admission.**—Child very drowsy. **Respiratory system:** There was moderate inter-costal and supra- and infra-sternal indrawing. Respirations were

regular and not very rapid. **Lungs:** There was no decreased resonance. The breath sounds were subdued because of the poor air entry. Coarse râles were heard at the bases posteriorly.

**Progress.**—The child was placed in a steam tent and given Codeia ¼ gr. There was some dyspnoea present during the night, but the colour was good. At 8.30 a.m. he suddenly died.

**Bacteriological report.**—Culture from the trachea, *Streptococcus hemolyticus* and *Bacillus influenzae*. Culture from the bronchi, *Bacillus influenzae*.

**Autopsy report (synopsis).**—**Larynx:** The mucosa appeared normal. The vocal cords were slightly swollen and pale. **Trachea:** Commencing just below the cords the wall of the trachea was lined by a greenish pseudo-membrane which extended down about three centimetres and gradually disappeared. This membrane was easily wiped away, leaving a red granular surface. The mucosa of the lower third of the trachea was normal in appearance. The glands at the bifurcation of the trachea were very large, soft, and red. The glands along the side of the trachea and bronchi were enlarged. (See illustration). **Lungs:** Right, the upper lobe appeared normal. The posterior part of the lower half of the lower lobe was dark red in colour and was firm. Left, the upper lobe was normal except the inferior border, which was firm and showed an area of consolidation the size of a hazelnut. The lower lobe was dark red in colour and semi-solid. On section. The surface was mottled and showed dark red areas alternating with grayish areas.

### Summary

These cases all occurred in healthy, robust, male children, between the ages of two and nine years. They developed in the months of January, February and March. In each case the onset was sudden with dyspnoea, hoarseness, and fever, the dyspnoea becoming progressively worse. Although hoarseness was present, in no case was the voice lost. The obstruction was subglottic and was relieved by tracheotomy, intubation being of no avail.

All these cases were thought at the first to be laryngeal diphtheria and were treated as such. Cough, although present, was negligible.

On examination the mucosa of the nose, pharynx, and larynx was of normal appearance. The vocal cords were pale and slightly oedematous. The appearance of the trachea as seen through the glottic chink was very similar in each case. Beginning immediately below the true cords the trachea seemed lined by a greenish gray exudate. In the early stages the lung signs were absent except for a poor air entry to both sides.

The progression of the disease was rapid. The dyspnoea was very troublesome and the toxæmia great. The duration in each case was about three days. Toxæmia was the apparent cause of death, but no doubt the laboured breathing must have been a factor in the myocardial fatigue.

Examination *post mortem* showed varying degrees of superficial ulceration of the tracheal mucosa very marked in the subglottic region and diminishing in the lower part of the trachea. In

one case, that in which the duration had been somewhat shorter than the others, the lower third of the mucosa appeared normal. Bronchitis was present in each case in some degree. Bronchopneumonia was present also but in no case was wide-spread.

#### *Comment*

It is not surprising that in each case a tentative diagnosis of laryngeal diphtheria was made. Simple catarrhal laryngitis was undoubtedly also thought of but in both these conditions the voice is lost and the onset is usually more gradual.

Acute bronchitis and tracheo-bronchitis give a very similar picture sometimes. In these conditions the mucosa of the entire upper respiratory tract is acutely inflamed and cough is generally an outstanding symptom. Dyspnoea may be present it is true, but is due to closure of the bronchioles from various causes and is not relieved by tracheotomy. Although the lung signs may not be apparent at first they usually appear early and are quite definite.

Primary tracheal diphtheria is said to occur but is apparently very rare. A culture of the tracheal exudate would, of course, be diagnostic and direct inspection of the trachea would show a different picture than in the cases described. The history in some cases of foreign body in the trachea is very similar to that of acute tracheitis. The presence of such an object can only be excluded by direct inspection of the trachea.

#### *Conclusion*

From what has been stated and from examination of the autopsy specimens it would seem that a

primary acute septic infection of the tracheal mucosa does exist as a definite clinical entity. Apparently in each case the trachea was primarily affected and this was followed by bronchitis and bronchopneumonia.

The important features of this condition are:

- 1.—Sudden onset of dyspnoea without loss of voice.
- 2.—Absence of Klebs-Löffler bacilli from the tracheal exudate.
- 3.—Absence of any primary focus of infection.
- 4.—Absence of lung signs of bronchitis or bronchopneumonia in the early stages.
- 5.—The presence of subglottic obstruction caused by the collection of exudate from the reaction of the mucosa in this region.
- 6.—Respiratory obstruction relieved by tracheotomy and not by intubation.
- 7.—Rapid course and high mortality.

#### *Suggestions for Treatment*

- 1.—Early tracheotomy if dyspnoea is at all marked.
- 2.—Constant supervision of the tracheotomy tube and maintenance of a free airway, if necessary, by the use of suction.
- 3.—Steam tent.
- 4.—General medical care and the employment of suitable drugs.

I wish to take this opportunity of thanking Doctors Hannah, Erb, and Boyd for their invaluable assistance in the preparation of this paper.

**Some Experiences With Gas Insufflation of Fallopian Tubes.**—Of ninety-four patients on whom 115 carbon dioxid insufflations of the tubes (Rubin tests) were made by G. L. Moench, New York, up to four on the same patient, the result was that twenty-nine women were found to have closed tubes and sixty-five open tubes. Of the ninety-four patients, eighty-eight underwent insufflation more than three months ago; of these eighty-eight, thirty-three had closed tubes and fifty-five open tubes, and of the latter, seven later became pregnant. Not a single instance of pregnancy occurred in those patients who, according to tests, had closed tubes. Moench concludes that the carbon dioxid insufflation of the fallopian tubes is a valuable and safe test when properly carried

out. The therapeutic value of the Rubin test is small, but real beyond a doubt, as shown by the fact that the tubes, after several carbon dioxid insufflations, often become more patent than before.—*Jour. A. M. A.*, June 13, 1925.

#### **Primary Tuberculosis of Bartholin's Gland.**

—So far only three cases of primary tuberculosis of Bartholin's gland have been reported. J. W. Gordon, Detroit, adds one case. This case is reported as primary tuberculosis of Bartholin's gland because careful examination, including exploration of the abdomen and roentgen-ray examination of the chest failed to reveal any other evidence of the disease.—*Jour. A. M. A.*, June 13, 1925.

## RHEUMATIC FEVER IN CHILDHOOD\*

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*Montreal*

THE subject of rheumatic fever has been forced on our attention in Montreal during the past winter by the greatly increased number of cases of the disease in our wards. For some years following the Great War the disease was apparently much less prevalent in many centres in America, so much so that several articles on the subject appeared in medical literature, most of them ascribing the decline to the wholesale removal of tonsils in children. Under this hypothesis it would be difficult to explain the great prevalence of the disease for the past year, especially in its most severe and fatal forms. Rheumatic fever in childhood differs widely from the same disease in adults. In the latter the arthritis dominates the picture and is often confused with other forms of arthritis, but in children rheumatic fever is a clear-cut specific disease, revealing itself by signs in many organs and tissues, lasting intermittently for years and leading to permanent invalidism or death in a large percentage of the cases. If the whole history of any patient is worked out, one gets the conception of a many-sided disease unlike any other disease, but comparable to syphilis or tuberculosis in its chronic course and manifold manifestations, and easily recognizable as one prolonged infection with recurrent exacerbations. Perhaps a synopsis of the course of a typical case treated in the Children's Memorial Hospital would make this clearer.

Annie S., a girl of nine years, previously healthy, developed scarlet fever on July 20th, 1924, and was treated in the Alexandra Hospital, Montreal. After the usual five-day fever, she was well for a week and then on August 3rd developed multiple arthritis with fever; these symptoms subsided under the use of salicylates but in September she again developed arthritis and was then recognized as having endocarditis. In October she developed chorea and was admitted to the Children's Memorial Hospital and on examination was found to have

multiple subcutaneous fibroid nodules and a serious cardiac lesion. The sequence of events was scarlatinal angina, multiple arthritis, endocarditis, fibroid nodules and chorea, or an infection starting in the throat and involving successively the joints, the heart, the connective tissues and the nervous system. The association of this infection with scarlet fever has been noted for centuries and is especially interesting in view of the recent identification of the scarlet fever streptococcus; whether a variety of this streptococcus causes rheumatic fever or whether the scarlet fever allows the rheumatic fever organism to become active, just as measles predisposes to active tuberculosis, is an open question.

Here then we have a typical case of rheumatic fever in a child, passing through its various manifestations in an unusually short period of time. Let us briefly consider these manifestations one by one.

First we have the *tonsillitis*, in this case associated with scarlet fever. The infection of rheumatic fever in most cases where one has an opportunity of observing the disease throughout its course begins in the throat, the tonsils are apparently the primary focus or port of entry. A rheumatic tonsillitis is apparently indistinguishable from other forms of tonsillitis. Again, although the tonsillitis seems to be the primary manifestation, once the disease is disseminated throughout the body, tonsillectomy can never be relied on to prevent subsequent manifestations, though the value of removing the original diseased focus is obvious. Consequently, though the great majority of our cases of rheumatic fever, chorea, and endocarditis have their tonsils removed, nevertheless we have had many instances of recurrence after the operation. When there is a definite history of a preceding attack of tonsillitis, acute arthritis is usually the next symptom, and comes on as in this case one or two weeks after the primary tonsillitis.

This brings us to our second manifestation or *arthritis*. The arthritis of rheumatic fever has

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three characteristics, which definitely distinguish it from all other forms of arthritis. First, it flits about from joint to joint, affecting one set of joints one day and another a day or two later. Second, no matter how acutely inflamed a joint is, how much effusion there is into the joint, or how much thickening of the tissues about the joint, there is never any permanent disability or alteration of the joint structures remaining. Third, if salicyl compounds are given in sufficient quantities, the fever falls and the joint inflammation clears up; to get this effect the system must be saturated with salicylates; small doses are useless. Salicylates act very much in rheumatic fever like iodides in syphilis, relieving certain symptoms without curing the disease.

The third manifestation is the *cardiac involvement*. Most cases of rheumatic fever in childhood have the heart involved sooner or later, the younger the child the more apt it is to have the heart involved. Of course it is the cardiac impairment which leads to the permanent disability or death of the patient. It is incorrectly labelled endocarditis for in all cases it is practically the whole heart which is involved. The cardiac manifestations then closely follow the arthritis and are of paramount importance as determining the future of the patient.

The subcutaneous *fibroid nodules* are almost peculiar to childhood, are pathognomonic, and when carefully searched for about the joints and tendons are found in a large proportion of our cases. These nodules are never present unless the heart is obviously involved, and their evil omen has been confirmed in our wards, for most

of our cases with nodules have died within a year or two.

The fifth and final manifestation is *chorea* or rheumatic fever affecting the nervous system. In the cases in which the full history can be obtained, this is always a late manifestation; it is rarely seen less than three months after the initial sore throat and arthritis. Fortunately for the patient, it practically never develops when the arthritis is present. Chorea in the course of rheumatic fever infection may then be compared to syphilis affecting the nervous system, since it is a late manifestation, shows profound systemic infection, and is very resistant to treatment.

In conclusion, the impression intended to be conveyed by this short address is that rheumatic fever is apparently a specific disease, a clear-cut clinical entity, with more pathognomonic signs than almost any other disease; that it is a chronic infection lasting for years and causing many manifestations in many organs, and that at the present time we are ignorant of the infecting organism and have no specific treatment. Recognizing that it is a chronic disease, ultimately so fatal and that the patients affected by it require special supervision for many years, there has been established in this hospital a separate clinic for these unfortunately children, generally known as the cardiac clinic, but including cases of chorea, rheumatism, and other potential cardiac diseases. The results have justified the effort and this constant supervision of the general health and bodily activities, with special attention to the nose and throat, seems special attention to the nose and throat, seems the best we can offer at present for the treat-

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**Pathology of the Hypophysis.**—It is evident from the seven cases reported by J. P. Simonds and W. W. Brandes, Chicago, that, with advancing age, in many persons the hypophysis undergoes fibrosis, and the body does not receive the normal amount of the secretion of this gland. Fibrosis of the anterior lobe of the hypophysis occurs with moderate frequency in persons past fifty. This condition is apparently due to arteriosclerosis of the vessels of the hypophysis. The character of the lesion

is such that it must interfere with the function of the glandular portion of this organ. This suggests one of the reasons for the failure of efforts at rejuvenation that are directed to the restoration of only one gland of internal secretion. One case of the series here reported appears to be true chronic hypophysis. In spite of the negative Wassermann test, other findings in the body suggest the possibility of syphilis as its cause.—*Jour. Am. Med. Ass.*, May 9, 1925.



## FAILING VISION AFTER MIDDLE LIFE WITHOUT ASSOCIATED PAIN\*

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THE invitation to speak to you to-day stated that I was chosen because of long experience as a practitioner and as a teacher. No doubt thirty-seven years is a long period of preparation, but I realize at this moment that something else is necessary—courage, or presumption or a combination of these qualities. I am to submit to you something of value culled out of the large field of medical ophthalmology in a talk of twenty minutes.

A clinic is usually more interesting than a lecture. Let us attempt to follow a clinical method and assume we have patients to deal with, patients who are past middle life and who find vision failing, without associated pain.

To begin with anyone past middle life will do. The majority of us are not aware of any limitations as to vision up to forty-five. After that comes a day when we suddenly realize that we cannot see the numbers in the telephone book, or in a railway time-table; we cannot thread a needle, or see properly some step in an operation, even though the light is good. Only near vision is imperfect but the annoyance increases till one is forced to give it consideration. For those who have worn glasses from an earlier period the same experience comes sooner or later, difficulty in seeing things close at hand—the bifocal age is upon them.

So the first question to ask our patient, who comes with the statement that his vision is failing, is whether he is unable to see at a distance or only near at hand. If the latter only, and his statement is verified by the use of test type, it is safe to assume that his trouble is only a matter of refraction and easily remedied by glasses. How many practitioners have test type or use them if they have? So far as I know there are very few, yet they cost a trifle, are easy to use and give valuable information.

If loss of vision is for all distances, the cause

may be an error of refraction; it is more likely to be an organic lesion. To distinguish between these a simple test may be made. Use a metal disc or card with a pinhole aperture before the patient's eye, first one and then the other, with test type at the distance of twenty feet. Vision is materially improved in case of errors of refraction—not at all if there is organic trouble. In the class of patients under consideration the only error of refraction possible is hypermetropia, latent in earlier life and now suddenly becoming manifest.

If loss of vision is for all distances and the pinhole test does not improve vision, our next question should be whether the failure of vision came on suddenly, rapidly or slowly. Each of these has its significance. Next ask whether one eye is affected or both. Finally a question as to general health. A few of these patients associate the eye condition with impaired health; most of them do not, and assert that they are in their usual good state of health.

That will complete the usual story from the patient. Now what are the possibilities.

*Sudden failure*, both eyes—uræmic amblyopia; one eye—hæmorrhage into the vitreous—detachment of the retina—embolus of the central artery.

*Rapid failure*—a type of cataract or an acute albuminuria.

*Gradual failure* points to a wide range of possibilities calling for most careful investigation. Ordinary forms of cataract, exudates into the vitreous, simple glaucoma, retinitis in its various forms, choroiditis, optic neuritis, and optic atrophy; finally nothing may be found in the eye to account for the diminished vision.

Now as to procedure. The majority of these cases are first seen by a general practitioner; a few go first to a consultant; quite a number go directly to the oculist. Some unfortunately take their way to opticians, who usually exploit them first with glasses. Too often the general

\*Delivered before the Ontario Medical Association, Toronto meeting, May, 1925.

practitioner sends them on to the oculist without any form of preliminary investigation.

All such cases should have a complete systemic examination, part of which will involve the use of the ophthalmoscope to learn the condition of the interior of the eyes. The function of the oculist is an important one but only part of what is required. The general practitioner should deal exhaustively with the case to the limit of his resources in trying to determine the cause of the symptoms, before sending the patient to an oculist. What he does himself, or can do with confidence, varies very greatly, depending on his training and his proximity to laboratory facilities.

As to the ophthalmoscope, it is constantly a matter of regret that so few practitioners learn to use it. Yet, merely to see conditions of the media and fundi, apart from refraction, is no more difficult than to learn the use of the stethoscope. The electrically lighted instrument is very easily mastered and can be used in any room that is not too brilliantly lighted. It is the ideal instrument for bedside use and ordinary office work. The fact is, however, that the practitioner who can use the ophthalmoscope is rarely met. Too often the doctor parts with his patient when he sends him to the oculist, particularly if he goes from home for the consultation.

What may be seen with the ophthalmoscope in these cases? Briefly,—opacities of the lens, opacities of the vitreous, retinal changes,—detachment, embolus, œdema, exudate—hæmorrhagic or other choroidal changes—pigmentary exudates and degeneration; changes in the optic nerve,—neuritis, choked disc, atrophies, and the cupping of glaucoma. These are the possibilities. When found there remains the interpretation thereof. None of the findings in the eye are absolutely distinctive. Those which are essentially local are the lens conditions, some of the vitreous opacities, the simple glaucoma and detachment of the retina. All others are entirely secondary to some form of general disease.

The oculist is not equipped to complete the diagnosis but must refer the patient to his own doctor again, or, with consent of the latter, to a consultant. There is need for a complete physical examination, urinalysis, blood examination and blood pressure tests, and a Wassermann.

The most common of these conditions is retinitis either alone or associated with choroiditis or optic neuritis and exhibiting exudates or hæmorrhages or papillœdema. And the cause of these changes in the eyes is most likely to be albuminuria. When the changes in the eyes are profound in the way of exudates or hæmorrhages, there is certain to be advanced disease of the kidneys with unfavourable prognosis; the termination likely in a period varying from three months to two years. So, if the doctor is keen he will examine and re-examine the urine of elderly patients who complain of failing vision, without associated pain, before he sends them to any consultant. When seeking albumin he may find sugar, though diabetes is more likely to cause cataract than retinitis or optic neuritis.

Next in order of frequency as producing failing vision with retinitis or optic neuritis, is syphilis. Some years ago I placed toxæmia from excessive use of alcohol and tobacco in second place but at present I relegate it to third place—not that there is less use of alcohol, but there is certainly more syphilis. In my early days of practice I saw many cases of syphilis. In the first decade of this century, indeed up to the time of the war, only isolated cases came under my care. For the last ten years there has been a remarkable increase. The eye conditions are not distinctive but even if the general condition is brought under control there is sure to be secondary optic atrophy and serious permanent loss of vision.

Alcohol and tobacco amblyopia is not less common in these days of prohibition. The last case to come under notice—a week ago—was from Watertown, N.Y. I have noticed during the recent years that a factor in the production of neuritis from alcohol seemed to be a change in the form of drink, forced upon a steady drinker by the difficulties of evading the law. Then there are the cases of neuritis and atrophy following poisoning by wood alcohol. Blindness is usually complete in the few cases of recovery. So, the doctor should learn the habits of these patients and deal with them courageously if necessary.

Less common causes of failing vision are the anæmias, lead poisoning, hysteria, empyema of the sphenoidal sinuses, and injuries. There is finally the obscure case, probably due to focal

infection not determined. Retinitis, choroiditis, neuritis, optic atrophy in combination, or separately, one sees all of them and is often not able to satisfy oneself as to the cause.

I conclude with this advice to my friends the general practitioners, first, examine your patients for yourselves; exhaust all your re-

sources before you send them on, but do this without delay; second, learn to use test type and the ophthalmoscope. You will be surprised how easily they are mastered and still more surprised and gratified upon the widening of your professional horizon and the extension of the frontiers of your scientific knowledge.

## INFECTIONS OF THE HAND

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IN order to properly diagnose infections of the hand an accurate knowledge of the anatomy is an absolute necessity. There is never any difficulty in remembering the position of the joints, but the location of the tendon sheaths of the thumb and fingers is not so readily kept in mind, so that a brief description of these will be given because they form the pivot upon which so many infections turn.

In the first place it is well to remember that there are no sheaths on the backs of the fingers. When a tendon sheath infection is spoken of it means a flexor tendon, and from the practical standpoint no other sheath about the hand is of much importance. Each finger and thumb then has upon its palmar surface a sheath for the flexor tendons. In the case of the index, middle, and ring finger this sheath commences at the base of the distal phalanx and extends for about three-quarters of an inch into the palm. The sheath lies deeply in the finger running close to the bones and joints, particularly the base of the middle phalanx. The little finger sheath commences in the same place as on the other fingers, but instead of ending in a similar position it suddenly expands into the palm to enclose the superficial and deep flexor tendons of the fingers as well as branches of the median nerve, and then proceeds upwards beneath the anterior annular ligament to a distance of an inch or more above the ligament and in close apposition to the pronator quadratus muscle. The sheath for the thumb likewise commences just beyond the terminal joint, and lies close

to the proximal phalanx, but then turns away from the metacarpal and the under surface of the anterior annular ligament and reaches a position on the outer side of the sheath of the little finger, with which there is a communication in a large percentage of cases.

There is a further anatomical point to keep in mind, and that is that between the tendons in the palm and the metacarpal bones with their interossei muscles there is a more or less closed space which is open towards the fingers, and it is into this potential cavity that infection so often enters forming a palmar abscess. One further observation upon the anatomy. The lymphatics of both fingers and palm travel towards the dorsum which explains why the maximum swelling is so commonly seen on the back.

Infections of the hand usually follow some form of traumatism either trivial or severe, although they may arise from a blood borne cause. Many of them are confined to the terminal phalanx and this group comprises the ordinary felon, infections of the subcutaneous tissue and paronychia. Infections occur at different levels here as elsewhere, so that there may be an inflammation in the subcuticular area only, in which instance blisters will form which quickly become purulent. If the seat of the trouble is immediately beneath the skin a localized cellulitis results, while in the true felon the infection commences beneath the periosteum. Clinically these latter groups can not be differentiated, for in each there is a swelling limited to the terminal phalanx accompanied

by pain of a throbbing character, which will prevent the sufferer from sleeping. The treatment in each case is the same; an immediate incision into the most tender area to one side, which should stop as soon as pus has been found. In neglected cases the whole diaphysis of the phalanx may separate as a slough. A paronychia or as it is commonly called "a run around" starts underneath the lateral edge of the nail; in the great majority of instances there is no hang-nail or history of injury. It tends rapidly to extend beneath the base of the nail to the opposite side. The picture is characteristic in that the skin adjacent to the nail is red, swollen and tender. The treatment consists in insinuating the flat end of an ordinary probe under the lateral edge of the nail, when pus will invariably be evacuated. In some cases this will suffice to produce a cure, but in the majority of instances it is necessary to remove the whole of the base of the nail. In neglected cases it is common to see exuberant granulation tissue springing from behind the base of the nail in the mid-line.

Furuncles are fairly common in the hand, particularly over the dorsum of the proximal phalanx where hairs are common. The indurated area is well localized, although there may be much oedema on the dorsum of the hand, and movement of the affected finger will be painful. A crucial incision to relieve the tension, followed by intermittent moist heat is the most appropriate treatment. As soon as the slough has been removed cicatrization rapidly follows.

The second group of infections,—those involving suppuration in the tendon sheaths is a much more important variety, and is the type that is frequently undiagnosed. The sheath may become involved in open wounds or secondary to an infective focus in the neighbourhood, but this latter is certainly rare. In the vast majority of the instances that I have seen, there has been a quite insignificant pin prick on the front of the finger or a small sliver has penetrated a short distance beneath the skin. Then within a few hours or days, depending on the length of time the streptococci take to get by way of the lymphatics to the sheath, the finger becomes intensely painful and rest is impossible. At this early stage there may be no redness of the finger at all, but there is always some swelling and usually this is greatest in the dorsum

of the finger, and later in the back of the hand. If the middle finger be the one selected, it will be moderately flexed and if there is much swelling, then the other fingers will be flexed as well.

To diagnose a tendon sheath infection of the middle finger—and the same applies to the ring and index fingers, there should be four causes of exquisite or excruciating pain, and these are produced by (1) straightening the finger; (2) pressure over the front of the middle phalanx; (3) pressure over the front of the proximal phalanx, and (4) pressure over the front of the head of the metacarpal.

These cases are very frequently not correctly diagnosed. The reason, I believe, is that we fail to make a proper examination. In the first place it is necessary to form a proper opinion of the individual's response to pain. This is done by palpating oedematous areas, for example, the back of the hand. These will undoubtedly be tender, but are not exquisitely so in normal individuals. Do the same to the back of the finger affected, taking particular care that you do not put any pressure upon the front. In this way palpate the middle and proximal phalanges and their joints on their dorsal aspect, and if carried out carefully no pain which makes the patient wince will have been produced.

Now extend in turn the unaffected fingers. Pain, depending on the individual, will probably be experienced, but not of the exquisite variety and is due most likely to the oedema in neighbouring structures.

Now carry out the four signs outlined above, and in each instance excruciating pain will be produced. Pressure upon the three points in front is applied by a finger and thumb to the front and back respectively, and therefore it is necessary to be sure that the pain is not caused by the dorsal pressure which is ruled out by the preliminary investigation of the back of the finger. It may happen that when seen the pain is not nearly so severe as previously. This may be due to the tension having been relieved by rupture of the sheath, which occurs at the proximal end into the palmar space between the tendons and the metacarpal bones. In addition to the local signs which are all important, there will be the usual accompaniments of malaise, fever, a leucocytosis and acceleration of the pulse rate.

The treatment of a tendon sheath infection



is immediate incision, and always under general anaesthesia, and with a broad tourniquet applied high up on the arm to assure a bloodless field. The great essential is to establish free drainage and prevent the spread of the infection to the palm. Two incisions usually suffice,—one on the side of the middle phalanx, the other on the opposite side of the proximal phalanx, and extend this incision about half an inch into the palm. If there is already a deep palmar abscess when first seen, as evidenced by exquisite pain and swelling proximal to the limits of the sheath, then push a pair of closed artery forceps beneath the tendon and to the side of the most marked palmar pain, and deep enough to feel the front of the metacarpal bones, and open them, when the pus will surely be evacuated. An elastic band is preferably inserted to ensure patency of the passage. Some surgeons prefer one long incision in draining such sheaths. The objection is that the tendons will likely protrude from the sheath, but on the other hand it provides the best drainage. When you consider that in practically all instances all movement at the distal and proximal interphalangeal joints is permanently lost, it probably doesn't matter much whether the tendon sloughs or not.

If one can diagnose an infection in a middle finger tendon sheath, an infection of the little finger sheath should not offer any obstacle. Besides the four signs indicated, there are the exquisite points of tenderness along the ulnar side of the palm and above the anterior annular ligament. Flexion of the thumb is to be expected because of the close association of the sheaths under the anterior annular ligament.

In treating a little finger sheath instead of stopping about half an inch above the web of the finger the incision should be carried upwards as far as the lower border of the anterior annular ligament. A second incision should then be made in front of the lower end of the ulna keeping close to its anterior surface. When through the deep fascia, by blunt dissection, keeping under the tendons and vessels and close to the ulna and radius and the pronator quadratus, a blunt pair of forceps is passed against the skin in front of the outer border of the radius and cut down upon and drainage instituted.

Suppuration in the flexor sheath of the thumb will have exquisite tenderness in front of the

proximal phalanx, to the inner edge of the thenar eminence and again above the anterior annular ligament. If the infection travels across from one side to the other, then a combination of little finger and thumb sheath infection is the result.

The treatment of thumb sheath infection is very similar to that for the little finger, except that the incision which opens the sheath in front of the proximal phalanx must not be carried up farther than half an inch distal to the lower border of the anterior annular ligament, which is about the size of a two cent stamp, otherwise the branch of the median nerve to the thenar muscles will be severed, as this nerve crosses superficial to the tendon.

The next important group of hand infections is that commonly called cellulitis. It is divided into two classes,—superficial and deep, the former being located in the superficial fascia while the latter is beneath the deep fascia. The former variety is by far the common type, and is usually caused by slight injuries such as abrasions or slight cuts. The deep variety is sometimes a sequel to the superficial, or it may complicate a deep wound from whatsoever source.

There are three varieties of superficial cellulitis: (1) Mild cases which clear up without suppuration; (2) cases complicated by suppuration, and (3) those in which there is no pus formation, but in which there is septicemia.

The mild cases are the most frequent, and are characterized by swelling, redness, tenderness and pain in the affected part, together with mild evidences of a toxæmia. Red streaks will likely be seen running either to the epitrochlear or axillary glands. If it is a finger which is involved there will be generalized tenderness, and movement of the finger will be painful because of the associated œdema in the joints and sheaths, but there will be no exquisite tenderness in the four areas as in sheath infection. In most instances there will be enlargement with pain of the epitrochlear or axillary group of glands. In a few days all signs and symptoms have subsided.

In the second group there are many different degrees of suppuration, varying from the single small abscess in the subcutaneous tissue to such a complete destruction of the hand that amputation is required. In this group the onset may

be no more abrupt than in the first group, but the patient's resistance, whatever that means, is below par, and the bacteria run riot with extensive local destruction. There is always great swelling on the dorsum, and in extensive cases the back of the fore-arm where abscesses frequently form. In very severe cases large areas of skin on the back become gangrenous. In still other types there is an associated tendon sheath infection followed by a deep palmar abscess, or there may be bone and joint involvement. At other times a small focus in the hand is quickly followed by a deep abscess in the forearm; while again it is not rare to see a trivial cellulitis in a finger followed a fortnight later by an axillary abscess.

In the third group, fortunately rare, the onset is sudden and within a few hours the individual is profoundly ill. A severe chill is often the first indication, and while the hand and fore-arm are quite badly swollen and great œdema is present on the dorsum, yet no pus formation occurs. There is little or no glandular involvement either in the epitrochlear or axillary regions, and the red streaks of lymphatic involvement are absent. There is in fact a septicæmia to which the patient quickly succumbs.

Arthritis and osteomyelitis, often associated in finger and hand infections, may be primary conditions, especially in wounds which directly open a joint, in which case the diagnosis is obvious from the pain, swelling and tenderness being located at the joint line. But they are common sequelæ to long standing inflammation originating as a cellulitis or tenosynovitis and when the discharging sinuses are examined we find necrosed bone.

The treatment of cellulitis as far as operative measures are concerned is particularly simple, viz. open abscesses when they form. The old plan, and I regret to say that still used by some, of making multiple incisions, not only does no good, but actually does harm. Apart from draining abscesses our sheet anchor is intermittent moist heat, and this applies to all varieties of hand infections where there is no pent up pocket of pus. The hand is placed in a bath containing hot saline with boracic acid, and left there for an hour in that position, after which it is removed, and wrapped in dry sterile

gauze for two hours, when the bath is again employed. This routine is kept up during the day and once at night if the patient is awake until the active process has subsided. No other local measures are necessary. In addition the general health must be supported by nourishing easily digested food, and excretion of toxins aided through the urine and fæces.

In all infections of the fingers and hand where there is the possibility of resulting deformity it is very important to see that the parts are kept in that position in which the greatest usefulness will ensue. For example, if there is only slight movement left in the fingers it will be infinitely better to have them in a partially flexed condition so that they can be approximated to the thumb than if they were completely extended. Again if fixation of the wrist is feared from extensive carpal involvement, then the hand must be kept dorso-flexed, else a very weak hand will result.

If there is a joint involvement, grating will be felt on passively moving one bone upon the other. As to treatment, certain general principles apply. All sequestra should be removed and conservatism should be the watchword when dealing with the thumb; the little finger is the least useful of all. If either arthritis or osteomyelitis of a finger is associated with a tendon sheath infection then amputation is the only procedure except in the thumb, since almost any kind of a thumb is infinitely better than none. At times a shortened finger can be obtained after sequestrectomy with a surprisingly good function.

Admittedly, the diagnosis of infections of the hand is difficult, and mistakes are of serious import to the patient. But again I repeat that most failures are due to hasty and improper methods of examination. The recognition and proper appreciation of tenderness on pressure lies at the bottom of success. It is not sufficient that the patient says a certain area is tender; the surgeon must satisfy himself that real tenderness is present, and not be misled by the tenderness which is so common an accompaniment of œdematous areas, otherwise he will be making incisions which are not only useless, but positively harmful.

## THE INFLUENCE OF NATURAL CHEMICAL STIMULI ON THE MOVEMENTS OF THE ALIMENTARY CANAL

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THE influence of chemical substances on the movements of the gastro-intestinal tract may be studied from different points of view. Submitting the different parts of the alimentary canal to the influences of different chemical agencies, one may study the conditions which are necessary in general for the normal function of its neuro-muscular apparatus. There is a great amount of corresponding experimental work. The prototype of all this work is the very well known Ringer's investigation on the influence of different electrolytes on the heart. Another point of view in the study of the reaction of the chemical substances on the movements of the alimentary tract is that of pharmacology. The action of those chemical agencies which may be applied in pathological cases is carefully studied. Being harmful to the body in certain doses these substances increase or diminish the motor activity of the gastro-intestinal tract. But there may be a third point of view on the action of the chemical substances which influence the movements of the digestive tract. Only those will interest us which are usually present in the alimentary canal or are absorbed by its walls. They may be the chemical constituents of the foodstuffs, or the product of their disintegration as well as the digestive juices themselves. The movements of the digestive tube are provoked or influenced not only by the mechanical properties of the food masses but in no lesser degree by their chemical components. The chyme usually represents a mixture of several chemical substances. Its nature varies with the different chemical properties of food-stuffs introduced into the alimentary canal as well as with the different properties of digestive juices, the secretion of which is provoked by these substances. Thus we meet here a special problem concerned with the influence of certain chemical agencies on the motor activity of the alimentary tract. This problem is to a certain degree independent of the analogous problems

of general physiology or pharmacology. Its final aim is the reconstruction from the analytical data of the process of movement of the alimentary canal during the normal conditions of digestion. From this point of view all the chemical agencies concerned, i.e., those of the digestive juices, food-stuffs and the products of their disintegration, may be called *natural chemical stimuli*.

*Chemical reflexes of pyloric and prepyloric sphincters.*—The simplest case of the action of the natural chemical stimuli is that of the so-called "chemical reflexes" of the pyloric (Hirsh, Mering, Marbaix, Serdujukoff, Lintvareff, Cannon<sup>1</sup>) and the prepyloric sphincters, Kelling, Shemjakin<sup>2</sup>; Cathcart<sup>3</sup>; Orbeli and Khosroeff<sup>4</sup>; Rojanski<sup>5</sup>). Acid in certain concentrations provokes from the duodenum and upper part of the jejunum strong contraction of the pyloric sphincter. The pyloric sphincter relaxes only after neutralization of acid by means of alkaline juices secreted in the duodenum. But this reflex is important not only as a mechanism regulating the passage of acid masses from the stomach into duodenum. The retention of food masses in the stomach plays an important part in the second phase of the gastric secretion. Moreover, the mechanical stimulation of the pyloric part gently increases the pepsin content of the gastric juice (Savich<sup>6</sup>).

Luckhardt, Phillips and Carlson<sup>7</sup> emphasize the relationship between pyloric opening and the motor activity of the stomach itself. According to their view the part played by the chemical control is exaggerated. But the experiments of Jegaloff<sup>8</sup>, which showed disturbance of the discharge of food masses from the stomach into the duodenum after ligation of pancreatic ducts in the dog, do not incline us to diminish the important meaning of the chemical agencies.

The "chemical acid reflex" on the prepyloric sphincter is weak (Orbeli and Khosroeff<sup>4</sup>). The action of the acid from the stomach on its sphinc-

ters is different; according to Cannon<sup>9</sup> acid relaxes the pyloric sphincter, although this view it not quite shared by other investigators (Ortner<sup>10</sup>, Hermann<sup>11</sup>). The acid determines the closure of the cardia (Cannon<sup>12</sup>).

Another well known "chemical reflex" of the pyloric and prepyloric sphincters is the closure of these sphincters by introduction into the duodenum of neutral fat, fatty acids, or soap (Lintvareff<sup>13</sup>, Edelman<sup>14</sup>, Orbeli and Khosroeff<sup>4</sup>; see also Tonniss and Never<sup>15</sup>). Of special interest is the following observation of Orbeli and Khosroeff<sup>4</sup>: Fat introduced into the duodenum provokes a strong long-continued spasm of the prepyloric sphincter (30 to 70 min.) In the meantime the pyloric sphincter relaxes and the duodenal content regurgitates into the pyloric part of the stomach. Thus the pyloric part of the stomach is fully separated for a certain time from the cardiac part, but is in free communication with the duodenum. This is, as it seems, a very important moment for the excitation of trophic secretory function of the pancreatic gland (Tonkich<sup>16</sup>).

*Hunger contractions.*—The natural chemical stimuli greatly influence the so-called hunger contractions. There is no precise evidence that the chemical stimulation of the mucous membrane of the mouth influenced the hunger contractions of an empty stomach by means of an unconditioned reflex (Carlson<sup>17</sup>). But the introduction into the stomach and the upper part of the small intestine of different acids, distilled water, fat, (Boldyreff<sup>18</sup>, Kaznelson<sup>19</sup>, Edelman<sup>14</sup>, alcoholic beverages, sodium carbonate and carbon dioxide, Carlson<sup>20</sup>) inhibit the hunger contractions.

*The natural chemical stimuli and the movements of the stomach.*—Cannon<sup>21</sup> brought clear evidence that the different food-stuffs (carbohydrate, protein and fat) of the same consistency and fed in equal amounts leave the stomach at different rates. The escape of carbohydrates through the pylorus is the most rapid of the three classes of foods. The discharge of proteins is much slower and the fat leaves the stomach at the slowest rate. Since the consistency of the used food-stuffs was approximately the same the different motor activity of the stomach could not be explained by the mechanical factors only. The chemical composition of food masses, the products of their disintegration

and the quantity and quality of digestive juices secreted in each case determined to a greater extent the phenomena observed.

What do we know about the influence of natural chemical stimuli on the movements of the stomach? Long ago Ducceschi<sup>22</sup> observed in the dog that the movements of the cardiac part of the stomach were increased by 0.1 to 0.5 per cent hydrochloric acid, whereas those of the pyloric part were inhibited. Edelman<sup>14</sup> in Pavlov's laboratory noticed the twofold action of the hydrochloric acid. It stopped the hunger contractions, but provoked special movements of the cardiac part of the stomach to which he gave the name "acid" contractions. He also saw the commencement of rather strong movements by introduction into the stomach even of 0.3 per cent sodium carbonate (alkalinity of the pancreatic juice). The analysis of these data on a more simple object—isolated frog stomach—revealed interesting relations. In all experiments of that kind, as well as in the whole animal, great service was rendered by so-called "filling method," when equal quantities of fluid under the same pressure, were introduced into the isolated part of the alimentary tract. Action of acids, especially hydrochloric acid, is twofold. In very weak concentrations (0.05 per cent) it provokes or increases the spontaneous contraction of the frog's stomach (Babkin<sup>23</sup>, Goldenberg<sup>24</sup>). This action of a weak solution of hydrochloric acid does not depend upon its hypotonicity (Goldenberg<sup>25</sup>), because the increase of spontaneous contractions of the frog's stomach was noticed also in cases when 0.01 normal hydrochloric acid was added to the physiological salt solution (Goldenberg<sup>24</sup>). In stronger concentrations, 0.1 to 0.2 per cent, the acid inhibits any contractions, diminishes the tonus, and lowers the excitability of the neuro-muscular apparatus. The isolated frog's stomach does not respond by contractions after the introduction into it of 0.1 to 0.2 per cent hydrochloric acid, even when the pressure of fluid is increased three times (Babkin<sup>26</sup>). The action of hydrochloric acid on the cardiac and pyloric parts of the frog's stomach is different. Weak solutions of acid stimulate the contractions of the cardiac part. The pyloric part of the stomach is highly sensitive to acid and first undergoes an inhibition. The same relations were observed by Ducceschi<sup>22</sup>, in the dog's stomach. But in the case of decreased



excitability of the cardiac part of the frog's stomach the inhibitory action of hydrochloric acid was first noticed there. These data show what a great part the state of excitability of the neuromuscular apparatus of the alimentary canal play (Babkin<sup>23</sup>).

The influence of alkalis (sodium bicarbonate, sodium carbonate, sodium hydroxide) is manifested in the greater activity of the frog's stomach (Babkin<sup>23</sup>, Goldenberg<sup>27</sup>). Alkalis greatly increase the activity of the pyloric part of the stomach. The cardiac part is much less affected or even inhibited by stronger doses. The action of alkali greatly depends on the excitability of the preparation used in each experiment. The same amount of alkali of the same concentration introduced into the stomach in some cases raised only the tonus of the muscular walls; in other cases it provoked a violent contraction almost of the whole organ (Babkin<sup>23</sup>). The action of acid and alkali on the movements of the stomach is peculiar for each of these substances. Thus both may increase the movements of the stomach. Under the action of an acid solution the tone of the organ declines, the activity of pyloric part is somewhat depressed and that of the cardiac increased. The waves of contraction are deeper but their speed is diminished. The alkali raises the tone of the muscular sheets of the stomach and there is a marked increase in the activity, especially of the pyloric part. The peculiar combination of all these phenomena makes the progress of the contractions characteristic for each agent. We have the right to a certain degree to speak about the *specific action* of the natural chemical stimuli upon the movements of the stomach (Babkin<sup>23</sup>).

*Small Intestine.*—The movements of the small intestine are also greatly affected by the natural chemical stimuli. From the old experiments of Bokai<sup>28</sup> we know that the products of decomposition of organic food substances such as  $\text{CO}_2$ ,  $\text{CH}_4$ ,  $\text{H}_2\text{S}$ , certain organic acids and skatol increase the intestinal movements. More recently Strajesco<sup>29</sup> has seen in a dog with permanent fistula in the lower part of the ileum increased movements of the intestine after introduction through the fistula of sodium carbonate (0.1 to 0.3 per cent solution), hydrochloric acid (0.05 to 0.3 per cent) 2 per cent solution of glucose and milk sugar, olive oil, Liebig's extract

and raw egg-white. Roger<sup>30</sup> reported the positive motor action of glucose and peptone.

First of all we must consider the action of hydrochloric acid in these concentrations, i.e., 0.1 to 0.4 per cent, in which it may be found in the duodenum and upper part of jejunum in normal conditions. If the mechanical effect of the control (saline) solution and the weak solution of hydrochloric acid (0.1 to 0.15 per cent) is equalized, the action of the acid is nevertheless uniform in all cases. The positive or negative character of the influence of acid depends on the conditions of excitability of the intestine, which differs in different experiments (cats). If the excitability of the gut is low and the saline does not produce any motor effect the equivalent amount of weak acid solution provokes contractions chiefly of rhythmic character. If the gut is already in a state of a rhythmic activity and contractions can be noticed after introduction of saline, the hydrochloric acid increases these contractions chiefly on account of an augmentation of diastole. The last possibility of the action of hydrochloric acid is its depressing effect. This effect is usually displayed in the presence of a strong motor activity of the gut (chyme in the intestine). The movements are diminished or stopped after their short preliminary increase or at once. The same inhibitory influence is provoked by strong solutions of acid (0.4 to 0.5 per cent) or repeated introduction of weak solutions (Babkin<sup>31</sup>).

Sodium carbonate and sodium bicarbonate in concentration 0.3 per cent and higher usually increase the movements of the small intestine (Babkin<sup>31</sup>, Woskresensky<sup>32</sup>). Soap (solutions of sodium oleate 5 to 10 per cent) provokes powerful contractions of the duodenum and the jejunum. Under the influence of soap peristalsis chiefly arises in the gut (Cannon<sup>33</sup>, Babkin<sup>31</sup>, Woskresensky<sup>32</sup>). The peristaltic waves may arise occasionally under the influence of acid, but this form of movement is not typical for the acid, as it is for the soap. Thus in the small intestine we meet again the problem of a specific motor influence of different chemical substances.

*Large Intestine.*—The solutions of hydrochloric acid chiefly inhibit the movements of the large intestine. The solutions of  $\text{Na}_2\text{CO}_3$  and  $\text{NaHCO}_3$ , soap, propionic, butyric, lactic, caproic acids increase the motor activity of this

section of the intestinal canal (Lurje<sup>34</sup>, Kikawa<sup>35</sup>).

*Changes of excitability.*—An extremely interesting point noticed in all these experiments is the change of the excitability in the neuro-muscular apparatus of the digestive tract as a result of the action of natural chemical stimuli. Everybody who has investigated the motor reaction of the intestinal tract knows very well how its excitability differs in different experiments. Usually it is greater in the fed than in the starved animal, but this rule very often does not correspond to the real conditions of the experiment. Choline may play a certain part in the variation of the excitability of the intestine in general and in relation to the natural chemical stimuli (see Heffter<sup>36</sup>, and Abderhalden and Paffrath<sup>37</sup>). Especially interesting are the experiments of LeHeux<sup>38</sup>, according to whom the different organic acids form with the choline of an isolated intestine esters of choline with the aid of a synthetic enzyme present in the intestine.

The action of natural chemical stimuli is probably two-fold. As we know, they themselves may stimulate or inhibit the neuro-muscular apparatus of the gastro-intestinal tract. The character of the response of the neuro-muscular apparatus depends on its state of excitability. Thus in an inactive duodenum acid excites strong contractions. But very excitable preparations are inhibited by the same solution. We find an analogy with this manifold action of natural chemical stimuli on the alimentary canal in the action of some pharmacological agents, e.g., atropin (Mayer and Gottlieb<sup>39</sup>) and chloralhydrate (Lembdner<sup>40</sup>). On the other hand the natural chemical stimuli may so change the excitability of the neuro-muscular apparatus of the digestive tract, that one and the same mechanical stimulus will produce different motor effects. This seems to be the case with sodium carbonate and sodium bicarbonate. In a certain stage of their action they raise the excitability of the alimentary canal, so that the mechanical stimuli, ineffective before, now provoke a strong motor reaction (Kupaloff<sup>41</sup>, Goldenberg<sup>27</sup>).

*Mechanism of action of natural chemical stimuli.* Very little is known about the mechanism by which the natural chemical stimuli act on the neuro-muscular apparatus of the alimentary tract. It is evident that the "chemical re-

flexes" of the pyloric sphincter may be mediated through the local nervous system. Section of vagi and splanchnic nerves does not change the rates of discharge of different food-stuffs from the stomach (Cannon<sup>42</sup>). But the intrinsic nerves have also an undoubted relation to the pyloric sphincter, the predominant effect of vagus stimulation being its inhibition and that of the sympathetic nerve being its constriction (Nakanishi<sup>43</sup>). Carlson and his co-workers<sup>44</sup> look on the inhibition of hunger contractions of the stomach by chemical substances from the stomach itself and small intestine as a reflex "by the long or central reflex paths, and short or local paths in Auerbach's plexus."

For the intestine, especially small intestine, the problem seems to be more complicated. Of course, one may suppose that the natural chemical stimuli act through the local nervous system. Heymans<sup>45</sup> denies the possibility of the presence in the blood of special gastro-intestinal hormones. But the experiments of Woskresensky<sup>32</sup> have clearly shown that the influence of natural chemical stimuli is not limited to that part of the digestive canal into which the solution is introduced. A remote isolated loop of small intestine, filled with saline, increased its movements when alkali was introduced into the isolated duodenum and stopped them if acid was substituted.

There is little doubt that in this and analogous cases the chemical substance is absorbed and may act through mediation of the blood on the nervous or muscular elements of the gut. This possibility leads us to two extremely important but very little investigated problems:

(1) The influence of changes of the composition of the internal medium upon the motor function of the alimentary canal, and (2) the inter-relation between the secretory and motor function of the digestive tract.

As regards the first problem there are some experimental results published in which the attempt was made to change the composition of the blood by introduction of different substances into the circulation. The reaction of different parts of the alimentary canal to a given mechanical stimulus was studied under various conditions. Some electrolytes— $\text{NaHCO}_3$ ,  $\text{Na}_2\text{CO}_3$ ,  $\text{CaCl}_2$ ,  $\text{KCl}$ , inorganic acids, lactic acids, Liebig's meat extract—greatly affected the motility of the small intestine (Melnikoff<sup>46</sup>, Sinelnikov<sup>47</sup>

King and Church<sup>48</sup>), and of the stomach (Dixon<sup>49</sup>, Kupaloff<sup>50</sup>). Although these experiments and others of this kind revealed very interesting relations between the chemical changes of the blood and motor activity of the alimentary tract, they hardly elucidate the normal conditions of the intestinal motility. The concentration in the blood of substances injected into it usually was higher than may occur in an animal normally. This fact reminds us of the sharp criticisms of Krogh<sup>51</sup> concerning the experiments which tried to demonstrate the action of acid metabolites on the capillaries. On the other hand the composition of blood seems to be not only very complicated but changeable too. As Clark and Gross<sup>52</sup> have demonstrated great individual variations occur in the action of fresh blood of perfectly normal animals upon isolated organs (gut, uterus, etc.) Thus the problems of inter-relations between the motor activity of the alimentary canal and the changes of composition of body fluids await solution.

Another problem which is of great importance for understanding the action of normal chemical stimuli is the relation between the secretory and motor function of the digestive tract. In another place<sup>53</sup> I have tried to systematize the facts concerning this problem. The increased motility of the gut coincides with the increased secretion, which may be partly explained by increased mucosal movements and retardation of lymph flow (King, Arnold and Church<sup>54</sup>). But from the point of view of the action of natural chemical stimuli the following facts require attention especially. The digestive juices are solutions of definite chemical character. As we have seen, they produce great effects upon the motility of the digestive tract. And there is no lack of evidence that in the duodenum and in the small intestine under different conditions (fasting, different food, etc.) the H-ion concentration varies widely, according to different authors from  $P_{\text{H}}$  4.7 to  $P_{\text{H}}$  8.23 (McLendon and others<sup>55</sup>, Okada and Orai<sup>56</sup>, Hume, Denis, Silverman and Irvin<sup>57</sup>). The same must be said about the large intestine. The H-ion concentration of infants' stools vary under different conditions from  $P_{\text{H}}$  4.6 to  $P_{\text{H}}$  8.3 (Tisdall and Brown<sup>58</sup>).

The secretion of acid or alkaline juices is however, formed from the constituents of the blood. Although during the digestion, according to Dodds<sup>59</sup>, there are no changes in plasma alkali

reserve or actual hydrogen ion concentration of the blood, certain alterations of blood composition still occur. Thus Kestner and Schlüns<sup>60</sup> observed during digestion in the dog changes in the "free" and "bound"  $\text{CO}_2$  of the blood. Dodds and McIntosh<sup>61</sup> have seen changes in blood  $\text{CO}_2$  tension in man, and Dodds and Smith<sup>62</sup> have observed a variation of chlorides in the whole blood, blood plasma, and corpuscles under the same conditions. It is interesting to compare these data with Mansfeld's<sup>63</sup> experiments, in which he demonstrated that  $\text{CO}_2$  acts as an automatic stimulus to the intestinal movements.

*Are these changes in the blood composition, and maybe others, without effect on the motility of the alimentary canal? Cannot they be especially effective in the system of the glandular organ itself during its activity?*

#### Conclusion

Certain chemical substances which occur in the gastro-intestinal tract (digestive juices, food-stuffs) we may consider as natural chemical stimuli of its movements. Their action may be purely chemical, fully independent of the mechanical effect produced by them on the gastro-intestinal wall (pyloric reflexes, inhibition of hunger contractions). In the case of a combined action of mechanical and chemical factors on the gastro-intestinal tract the character of its motor reaction depends on both. One cannot explain the arising of different forms of movements (rhythmic segmentation, peristalsis, anti-peristalsis) by the different mechanical effect of the chyme only. Its chemical changes in course of digestion greatly affect the motility of the tract. Different natural chemical stimuli of which the mechanical effect on the alimentary canal is equalized, act differently according to their chemical nature. Therefore the different forms of movements arise probably as a result of the combined action of mechanical and chemical factors.

The action of natural chemical stimuli may be excitatory as well as inhibitory. This depends not only on the chemical nature of the stimulus employed but also on the state of excitability of the alimentary tract. The natural chemical stimuli themselves greatly affect the excitability of the neuro-muscular apparatus of the intestinal tract. The representatives of the typical

classes of the natural chemical stimuli (acids, alkalis, soap) act to a certain degree as specific stimuli provoking in each case a peculiar reaction of the muscular wall of the tract. The mechanism of the action of natural chemical stimuli is not clear. They may act through the nerve paths, but, being absorbed, they may change the excitability of the neuro-muscular apparatus in other parts of the tract and vary in a positive or negative sense its sensitiveness to the mechanical or chemical stimulations. The changes of the composition of blood greatly affect the reaction of the gastro-intestinal tract. There is little doubt that the systematic study of the action of natural chemical stimuli in normal and pathological conditions will help to reconstruct the whole course of the process of the movements of the alimentary tract.

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**Chlorine Treatment of Colds.**—The claims for the efficacy of the chlorine treatment of colds come from sources which command respectful consideration. As a matter is still in an experimental stage, it must be subjected to further scientific investigation, both from the clinical and laboratory points of view. Experimentation, except on the basis of a strictly scientific control, can not contribute anything of constructive value.

It is the opinion of the Public Health Committee of the New York Academy of Medicine that this method of treatment should not be

generally applied until such time as carefully worked out experiments have demonstrated its value and have established a method of procedure free from any harmful effects.—New York Academy of Medicine, Public Health Committee Report for 1924.

The Royal Horticultural Society, London, has awarded the Lindley gold medal to Albert C. Burrage, of Boston, president of the Massachusetts Horticultural Society and of the American Orchid Society, for his display of New England plants at the recent Chelsea show.



OBSERVATIONS ON THE VALUE OF THE DIAZO-COLOUR-REACTION  
IN THE DIFFERENTIAL DIAGNOSIS OF URÆMIA\*

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INDIVIDUALS with arterial disease of long duration usually develop renal disease, and, conversely, if the primary condition is renal and of sufficient duration, arterial disease develops. Thus, whether renal or arterial primarily the ultimate picture is cardio-vascular-renal. As the latter condition progresses towards termination, it is often very difficult, clinically, in the absence of signs of heart failure, to determine the predominant lesion. Albumin and casts in the urine, hypertension, hypertrophy of the heart, and changes in the fundi are common to both conditions. Urine analyses and renal efficiency tests may be of assistance in the differential diagnosis. Urea retention is a characteristic finding in the various forms of so-called chronic interstitial nephritis, but is usually a late manifestation in the type secondary to arterio-sclerosis. Of the small contracted kidney (primary or secondary forms) polyuria and a pale coloured urine of low density are characteristic, whereas with the arterio-sclerotic form the volume of urine may be normal or reduced, the colour good, and the specific gravity normal. At the termination of the disease, the complex clinical picture makes the diagnosis still more difficult. The possible cerebral manifestations of advanced arterial disease may very closely simulate those of uræmia. The best observers often disagree as to whether the signs noted in a given case, are due to uræmia or arterial changes in the brain.

In March, 1924, Andrewes<sup>1</sup> first recorded a reaction which he noted in the sera of patients suffering from nephritis. On applying the Van den Bergh reaction for bilirubin in the blood to sera from nephritic individuals, an orange-buff colour was noted. The other characters of the reaction were that the buff colour made its appearance very slowly and after standing twenty-four hours, it turned pink instead of green, on the addition of alkali. The indirect test (in alcoholic solution) was used. Strong alkali (NaOH)

was found necessary to yield the pink colour. Ammonia and sodium carbonate were ineffective.

The reaction was obtained in every case of uræmia in which the diagnosis was corroborated by the *post mortem* findings. It is not due to any known normal constituent of the blood. Twenty-two other patients suffering from various diseases (names not given) were studied, and in these the reaction was not noted.

More recently Hewitt<sup>2</sup> observed positive reactions in twelve cases of uræmia; he made some observations on the nature of the substance responsible for the reaction, and suggested it might be due to a cyclic amine. He also simplified the procedure of the test. In place of waiting twenty-four hours for the full development of the reaction before adding the alkali, it may be added after boiling the reaction mixture for thirty seconds. Oxalated blood plasma may be used instead of serum and is more convenient.

The more rapid test in detail is performed as follows:

The technique of the first part of the test is identical with the Van den Bergh bilirubin reaction (indirect method)<sup>3</sup> except that the blood may be oxalated. To one cubic centimetre of plasma or serum is added 2 cc. of 96% alcohol. The proteins are allowed to precipitate, and the mixture is filtered or centrifuged. The clear filtrate or supernatant fluid from the centrifuged specimen is then collected. To one cubic centimetre of this clear fluid is added 0.5 cc. of alcohol and 0.25 cc. of the diazo reagent (freshly prepared). The mixture is boiled for thirty seconds and then a few drops of a ten per cent solution of NaOH are added.

The characteristic reaction is the very rapid development of a pink colour which disappears also rapidly. The intensity of the colour, and the rate of its disappearance, depends upon the concentration of the substance in the blood. The reaction mixture must be watched very carefully during the addition of the alkali, since the

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pink colour may appear and disappear within a few seconds.

The data obtained and recorded here corroborate the original findings of Andrewes and of Hewitt. The blood of patients with various diseases has been studied, including four cases of typhoid fever. The reaction has been found only in blood from subjects showing marked retention of waste products, with lesions such as advanced chronic nephritis or acute surgical conditions of the kidneys, pyonephritis, etc. The blood of six patients who died of uræmia, and in whom the diagnoses were confirmed by autopsy, all showed positive reactions. In one patient in the hospital now with advanced chronic nephritis, though not actually in uræmia, the reaction was also found positive.

In another series of individuals, all had albuminuria, hypertension, and some retinal changes. The kidney function tests in all the cases showed impairment in concentration power, demonstrated by the urea concentration factor. This test is of particular significance here since the above conditions, when advanced, are associated with a disturbance in the excretion of nitrogen. In the majority of these the clinical signs were characteristic of arterial disease (hypertension, apoplexy etc). In two only clinical signs suggestive of uræmia were found. In these there were no autopsies. In all these instances the diazo-colour reaction was negative.

In view of the positive reactions invariably noted in definite uræmics, and the negative reaction in the subjects with obviously predominant arterial disease, the negative reactions noted in the few cases with suggestive uræmic symptoms appear to have some diagnostic significance. In Table 1 are recorded the combined results of the above series. The cases showing positive reactions are grouped together.

That the reaction is not always associated with fatal termination was shown in the following case of severe nephritis occurring during the course of pregnancy. The patient ultimately recovered from the acute stage, and the reaction became negative. (See table below.)

That a positive reaction may have a greater prognostic significance, as regards the time factor,

than the blood creatinine in chronic nephritis, is suggested from the findings in Cases No. 2, 6, and 8. Cases No. 2 and 6 died in uræmia before the creatinine had increased to five milligrams per 100 cc. blood. Case No. 8, now in the hospital, both from the clinical (Dr. A. H. Gordon) and the laboratory observations, (urea nitrogen 126 mgm. creatinine 3.84 mgms. and urea concentration factor—3) is an advanced chronic nephritic. The diazo-colour reaction is positive. The blood creatinine is still below 5 mgms. per 100 cc.

Hewitt suggested that the substance responsible for this reaction might exist normally in the intestines, and that its presence in the blood in uræmia may be due to defective elimination by the kidneys. This would strengthen one of the prevalent views as to the aetiology of uræmia. The probability, however, that it may be one of the products of an altered metabolism, another prevalent view, is suggested by the findings in surgical lesions of the kidney, as the following case demonstrates:

*Case No. 5.* A male, age twenty-eight, was admitted to the Montreal General Hospital, service of Dr. F. S. Patch, on January 3, 1925, with a diagnosis of bilateral renal tuberculosis and anuria. There was a history of anuria for three days prior to admission. On the day of admission the blood findings were: urea nitrogen 90 mgm. and creatinine 6.00 mgm. per 100 cc. The diazo reaction was negative. The patient was seen by Dr. C. P. Howard on January 26th, and at that time the clinical picture did not correspond to the laboratory findings. Dr. Howard's impression was that the patient did not look ill in spite of the history. The blood urea nitrogen the following day was 96 mgm. per 100 cc. The diazo reaction was negative. Two days later the blood urea nitrogen was 140 mgm. per 100 cc., and the diazo reaction was negative. Following a nephrostomy, the blood urea nitrogen decreased gradually, and on January 31st, it was 22 mgm. per 100 cc. Following this day the value for the urea gradually increased, and on February 5th, it was 65 mgm. per 100 cc. At this time the diazo reaction was positive. Five days later the blood urea nitrogen was 90 mgm. the diazo

Date	Blood urea N. mgms. per 100 cc.	Urine urea conc.		Urea conc. factor	Diazo reaction	Remarks
		1st hour	2nd hour			
February 9.....	71	0.66	0.72	5	Positive	B.P. 190-110
March 2.....	32	0.48	0.60	9	Negative	
March 12.....	52	1.08	1.06	6	Negative	

reaction was positive, and the patient died in uræmia.

It appears reasonable to assume that the high blood values prior to nephrostomy were largely due to mechanical obstruction (pus, etc., in the ureters) rather than the destruction of renal tissue. It would otherwise be difficult to explain the remarkably rapid fall in the blood urea nitrogen,

(144 to 22 mgm.), following nephrostomy. Mechanical obstruction was further suggested by the other blood findings, in that a general rather than a selective retention of waste products was noted. The combined clinical and laboratory picture also suggested mechanical obstruction, namely, the absence of signs of uræmia in spite of the marked retention of the waste products.

TABLE I

No.	Mgms. per 100 cc blood		Urine urea conc. %		Urea conc factor	Enlarged heart	Blood pressure	Fundi	Diazo reaction	Remarks
	Urea N	Creatinine	1st hour	2nd hour						
1	170	8.10	....	....	..	+	175-110	+	+	Chr. int. nephritis. Uræmia Post mortem findings positive.
2	132	3.89	....	....	..	+	...	0	+	Chr. int. nephritis. Uræmia. P.M. findings positive.
3	206	6.52	....	....	..	+	210-140	0	+	Chr. int. nephritis. Uræmia P.M. findings positive.
4	71	....	0.66	0.72	5	+	190-110	0	+	Chr. nephritis. Pre-eclampsia. Recovered.
5	90	....	....	....	..	0	...	0	+	Pyonephritis. Uræmia. P.M. findings positive.
6	140	3.87	....	....	..	+	28-110	0	+	Chr. nephritis. Uræmia. P.M. findings positive.
7	210	5.77	....	....	..	0	...	0	+	Pyonephrosis. Uræmia. P.M. findings positive.
8	126	3.84	0.93	0.87	3	+	...	+	+	Chr. nephritis. Preuræmia. Now in hospital.
9	24	1.46	....	....	..	+	240-160	+	0	Chr. nephritis. Myocarditis.
10	105	2.00	....	....	..	+	160-100	+	0	Cerebral arterio-sclerosis. Uræmia? Acute otitis media. No autopsy.
11	31	2.00	0.70	0.72	13	+	190-130	+	0	Chr. nephritis. Uræmia. No autopsy.
12	32	1.94	0.90	1.09	12	+	210-114	+	0	Chr. nephritis. Toxæmia of pregnancy. Recovered.
13	20	1.66	2.37	2.46	48	+	200-136	+	0	Chr. nephritis. Arterio sclerosis.
14	20	....	0.96	1.26	26	+	260-155	+	0	Chr. Neph. Hypertension
15	15	1.46	0.72	1.08	24	+	180-100	+	0	Arterio-sclerosis.
16	36	1.99	0.84	1.26	15	+	190-90	+	0	Chr. neph. Hypertension
17	28	1.87	0.60	0.70	10	+	186-120	0	0	" " "
18	39	1.76	0.68	0.84	7	+	170-128	0	0	" " "
19	31	1.74	0.58	0.50	7	+	194-	+	0	" " "
20	43	2.67	....	0.98	8	+	225-160	+	0	" " Arterio-sclerosis. Uræmia? Left the hospital.

As the pyonephritis became more marked, and a greater destruction of renal parenchyma took place, the diazo reaction became positive. The latter reaction was now noted when the degree of retention of urinary products in the blood was much below that noted before nephrostomy. Defective elimination is therefore, probably not the only factor causing the appearance of this unknown substance in the blood.

In view of the observations made by Andrewes and Hewitt, and those recorded above, the diazo-colour reaction appears to be a valuable aid in the diagnosis of uræmia.

I wish to gratefully acknowledge my indebtedness to the chiefs of the various services, and Dr. L. J. Rhea, pathologist, of the Montreal General Hospital, for the material made available for these observations.

*Note:*—Since this paper went to press, patient 8 died, and the clinical diagnosis was corroborated by the post mortem examination.

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## SOME DISADVANTAGES OF THE WORKMEN'S COMPENSATION ACT WHICH LEAD THE EMPLOYER TO BE LESS INTERESTED IN THE HEALTH OF THE EMPLOYEE\*

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*Toronto*

ONE of the essential features of the Workmen's Compensation Act is that it makes a partnership of the employee and employer in a total and unnecessary loss account. In most states the loss is a 50-50 arrangement. In Ontario it was a 45-55 in the original Act but is now a 33-66 proportion.

So-called accidents are the result of placing an inadequate employee on a job. The job may even be so difficult that no employee could be competent for the work. The one who places the employee is the foreman. To place the right man on the right work is the foreman's job and there is the crux of the situation. Automatically accident will indicate the incompetent foreman, and the greater part of the loss lies with the employer.

If accidents are preventable, and the employer is the one most penalized, why does he not take more urgent steps to prevent accidents? Accident associations convene, make speeches, pay fees, have paid officials, issue excellent accident preventive literature, and yet,

despite decreased employment and lower rate of wages the gross compensation costs remain stationary or increase. The answer to the question is that the present Board does not function properly. If the manufacturer protects his employees by proper preventive and surgical supervision and reduces his compensation cost to a minimum, the difference between his cost and the group cost is in larger part absorbed by the careless work of some member or members of the group to which he belongs.

It is true that there is a rebate system which is averaged over a period of three years, but this system while perhaps intelligible to an actuary is a weird though expensive joke to the average employer. A grouping is necessary to the smaller employer lest a large accident cost cripple him financially and the employee have his security reduced. This is not true of the middle or larger employer, and a graded scale of individual responsibility could well be worked out even for the smaller employer. At present 2 per cent of all assessments are set aside as a catastrophe fund and this might if necessary be enlarged to absorb any added risk.

\*Read at the Conference on Industrial Medicine, Ontario Medical Association, at the Academy of Medicine, Toronto, January 14, 1925.



If Bill Smith (foreman) allowed John Jones (an employee under him) to lose an arm, and the whole cost were immediately assessed on the employer, Bill Smith would be immediately asked why, and if unable to explain satisfactorily, would quite properly be replaced and the employees protected. Two thousand dollars to \$4,000 loss is given grave consideration even in a large firm if immediately assessed, but when assessed over the industry group and merged in three years' accounts, it becomes of much less and immediate importance and is relegated to the time of settlement. Three years is too far away to investigate and correct the present faults of administration and the details will have become too indistinct to fix responsibility. What is true of the larger amounts is true of the lesser losses.

Effort of any sort to reduce loss under the present system seem so futile to the employer that, in his effort to succeed and incidentally make a living for his employees, he wisely dismisses worry over past accidents. Probably a still greater deterrent to the employer in eliminating accidents in his plant is his sense of the injustice of his producing good results and failing to reap the rewards. This injustice adds to the sense of futility a bewildered feeling of resentment at the ways of the Board, and since the condition is inevitable, his attitude is, "why worry, let us forget it." However interested the employer may have originally been in the welfare of the employee this attitude of mind has in most cases its effect. If the administration of the act fails to adequately reimburse him for a better service why should he add to his compensation cost uncalled for attention? A concrete case would work out as follows:

If a firm have an assessment of \$10,000 and add to it the cost of a nurse at \$1,500 and a surgeon at \$5,000 the total cost will be \$16,500. If it reduce its compensation claims to \$5,500 or less he can get as a maximum rebate \$3,000, leaving the total cost at \$13,500. Thus it pays

to take the lesser or full cost of compensation. Why employ a nurse or full time surgeon when it means an increase of \$3,500 cost?

There are, however, offsetting advantages to the cost of a full or part time surgeon in lessened lost time by employees and consequent inefficiency.

The surgeon soon learns the innate causes of disability in the factory, the places where sepsis or intoxication are most likely to occur and forestalls them, and if he have the confidence of the employees, he becomes a registry of unnecessary and potential hazards, and becomes the best inspector of hazards. He fortifies employees of low vitality, checks epidemics of sepsis in their inception and decreases in a very real and practical way the claims for compensation.

The added cost of proper attention, while in the interest of the employees and of the industry at large, is, when localized to the individual industry, not the type of expenditure encouraged or permitted by a hardheaded executive, or the banks by whose assistance most industries are carried on.

It was part of the stated intention of the Workmen's Compensation Act to eliminate litigation over damages for industrial injury, securing to the employee a fair ratio of remuneration during his disability and, to the employer as a *quid pro quo*, freedom from the annoyance and loss through suit. It can scarcely be held that the purpose of the original Act was to chloroform initiative on the part of the employer and employee in lessening the occurrence of accidents, for there was a provision in the original Act for special rebates to firms providing special services. The method of rebate was left to the discretion of the Board.

Whatever the intention of the Act may have been, the policy of the Compensation Board has acted as an efficient bromide to initiative in cutting the loss by industrial accident. This is the manifest interpretation of the continued large sums disbursed for compensation.

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"THE greatest trust between man and man is the trust of giving counsel."—Bacon.

"ABOVE all things they must remember that

they are called of God to this vocation, therefore they should go to it with a high courage free of all fear."—Ambrose Paré.

## THE POST-OPERATIVE TREATMENT OF FLEXION AT THE HIP\*

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ABOUT two years ago a patient presented himself at the Children's Memorial Hospital suffering from deformities of both hips. There was flexion and adduction at the one hip, and flexion and abduction at the other. These deformities followed an infectious arthritis for which he had been treated elsewhere. He was a helpless cripple. It was decided to endeavour to get him on his feet. It was felt that he might be able to get about with crutches. For this reason a subtrochanteric osteotomy was performed on one side, and an endeavour made so to straighten his limb that he might be able to stand on it. Following this osteotomy it was noticed that the lower fragment was pulled upwards so that it over-lapped the upper fragment for a distance of about two inches. This was not considered disadvantageous, because the other lower extremity was shortened, and this up-pulling of the osteotomized extremity equalized the length of both. Nevertheless this history brought certain things to mind: first the difficulties of maintaining the osteotomized ends when great correction is necessitated; second, the inadvisability of suddenly changing the alignment of the bones of an extremity which has long been deformed; third, the dam-

age which might be done to vessel, nerve, and other tissue by such sudden change.

For this reason it was decided that, in future, patients for whom it should become necessary to perform a subtrochanteric osteotomy for deformity should be treated by traction and gradual reduction of the deformity, as callus was thrown out which would act as a hinge to the fractured extremities, and as the soft tissues readjusted themselves to the new conditions.

Six months ago it became necessary to perform a Gant's subtrochanteric osteotomy. We profited by our past experience, and treated according to the method enunciated. The result was that we were able to maintain the fractured extremities in virtual apposition as we gradually reduced our deformity about a hinge formed of soft callus.

Only three weeks ago it became necessary to perform another subtrochanteric osteotomy. Again we treated our patient by traction with gradual reduction of the deformity and were able to maintain the osteotomized extremities of the femur in apposition until the developing callus and the altering conditions of the soft parts allowed of a gradual correction of the deformity from which the patient suffered.

\*Read before the Interstate Post-Graduate Assembly, Montreal, May 22, 1925.

**Health Rules.**—The following rules for promoting health and longevity have been suggested by Dr. Seilikovitch, a well-known physician of Philadelphia. It will be hard to find a better or more comprehensive list of rules for promoting health and longevity than these twelve suggestions:

- 1.—Use moderation in everything: drinking, eating, working, exercising, resting.
- 2.—Do not worry: smile and whistle.
- 3.—Deep breathing of fresh air everywhere: when asleep or awake, indoors and outdoors.
- 4.—Clean out the bowels, and keep them clean.

- 5.—Keep clean the body, mouth and mind.

- 6.—Eat slowly, always using more fresh vegetables and fruit than animal food.

- 7.—Exercise not to fatigue: the best of all exercises is walking.

- 8.—Dress according to season and weather.

- 9.—Avoid draughts, dampness, chilliness.

- 10.—Do not lose your temper.

- 11.—Do not find fault: always try to look on the bright side of life.

- 12.—Take a vacation once a year, no matter how short: a change of environment is a great tonic.—*American Medicine*, April, 1925.

## Case Reports

### LOBAR PNEUMONIA COMPLICATED BY DIPHTHERIA AND PAROTITIS IN A CHILD OF FOUR YEARS

J. P. BOLEY, M.B.

*Timmins, Ont.*

R. A., aged four years, male, was first seen December 15, 1924. There was a history of illness of one week's duration, beginning with feverishness and headache; later on coughing, restlessness and insomnia appeared, and the child became progressively worse. On examination, one noted facial pallor, heat and dryness of skin, and absence of clinical signs in throat, neck and chest. Restlessness was marked. Temperature, 103.1° F.; pulse, 120; respirations, 28.

December 17th. Crepitant râles were heard on right side of chest, especially in area of upper and middle lobes. The breath sounds here were relatively feeble. The classical signs of lobar pneumonia, i.e., flushed face, herpes labialis, increased vocal fremitus, consolidation and tubular breathing rapidly ensued. Between this date and December 23rd the temperature was frequently 105° F. and the patient was profoundly toxic.

December 24th., signs of resolution appeared and the chest signs eventually disappeared by lysis.

December 25th, routine examination of the throat showed greyish white patches on left tonsil and soft palate of that side. A swab was taken and diphtheria antitoxin injected. On the report "positive for diphtheria" being received, antitoxin was administered freely. The temperature which had been between 101° and 102° F. now took a drop, remaining practically normal for several days. The patient's general condition rapidly improved.

Convalescence appeared to be setting in when another complication was noted. On the evening of December 27th a swelling appeared in the right parotid region, apparently limited to the parotid gland. No other glands were observed to be enlarged. Coincident with this enlargement, there was a rise of temperature to 101° F. With the subsiding of the tumour,

the temperature gradually returned to normal. The condition was accordingly diagnosed as a parotitis. After this time the child made an uneventful recovery. Seen three months later, the robust health previously enjoyed had been reattained.

### RETRO-PHARYNGEAL ABSCESS

W. G. SMITH, M.D.

*North Bay, Ont.*

The patient, a boy two and a half years of age, whose previous health had been good, had a mild attack of scarlet fever which commenced April 8th. A few days after the onset a swelling appeared on the right side of the neck and at first was regarded as an adenitis so frequently seen in throat infections. The swelling continued to enlarge and coincident with it the child's voice became husky and the breathing difficult. The posture was characteristic, child lying on the left side, neck extended, head thrown backward and to the left. The pharynx was examined frequently but no bulging could be detected either by inspection or palpitation. As the distress in the breathing became progressively worse operation was decided upon. On April 23, the child was anaesthetized and the usual incision made along the posterior border of the sterno-mastoid. While identifying the latter the patient suddenly collapsed, respiration ceased, the face became cyanosed and pupils widely dilated. It seemed like a case of respiratory failure. Artificial respiration was commenced when the child gave a violent expiratory effort and at the same time a gush of pus came from the mouth and nostrils. The swelling in the neck had disappeared! Realizing that the abscess had ruptured into the pharynx the patient was quickly inverted, the pharynx swabbed frequently and the pus expressed from the nostrils. Patient was returned to bed, the latter being elevated at the foot to allow the pus to escape into the mouth. Recovery was uneventful. Septic pneumonia did not occur.

*Comment.*—In searching the literature upon the subject of retro-pharyngeal abscess one is impressed with the meagre description of this condition, the operative treatment is fully de-

scribed but the clinical picture is not. Moreover there were some features of this case worthy of special notice. For instance, one would infer that bulging of the posterior or lateral pharyngeal wall can be made out in all cases and that without it a diagnosis of retro-pharyngeal abscess would be doubtful. The above case shows clearly that such is possible. This feature may prove misleading and thus cause operation to be delayed too long as happened in this instance. Other features worth noting were that the child's colour remained good even though the voice was husky and breathing difficult, and again the temperature was normal even in the afternoon. I usually visited the patient in the morning but when specially visited in the afternoon the temperature was still normal. In regard to diagnosis,

in cases of acute infections of the cervical glands the swelling is at first hard; redness follows and along with it tenderness upon pressure, and finally fluctuation when suppuration occurs. In retro-pharyngeal abscess the swelling appears at the posterior border of the sterno-mastoid; it is not hard but is already fluctuating, redness may be absent and tenderness also as in this case one could press firmly without causing the child to complain. Fluctuation occurs at the posterior border of the sterno-mastoid and later may appear at its anterior border. When pressure is exerted posteriorly the pus is forced underneath the muscle and appears anteriorly and vice versa. The sterno-mastoid lies astride the collection of pus.

**Rare Manifestations of Epidemic Encephalitis.**—E. Trömmner (*Deut. med. Woch.*, January 16th, 1925, p. 99) has observed about sixty cases of epidemic encephalitis in his hospital during the past three years, and among them there were fifteen with symptoms which have hitherto been seldom or never described. In one case there was a bright red scarlatiniform rash over the chest and back at the height of the attack, when the temperature was 106° F., and the patient was breathing very rapidly. Death occurred early in this case. In another, that of a lad aged sixteen, the symptoms began with loss of appetite, restlessness, pain in the throat, and diplopia. Delirium ensued, and during convalescence a small-scaled desquamation of the hands and forearm occurred. In another case, that of a man aged forty, the first symptoms were insomnia, slight fever, and diplopia. He was unconscious for three weeks; some time after he had recovered consciousness he was drowsy even by day, and physically and mentally lacking in adaptability. Afterwards his weight increased, and both hands became swollen, the swelling being suggestive of Quinke's oedema. These conditions seemed to be permanent and refractory to treatment. The author's list of unusual sequels to epidemic encephalitis includes, in addition to myxoedema of the hands, hemiatrophy of the tongue, hemiataxia, and

hemiepilepsy resembling Jacksonian epilepsy. The author records also three cases of epidemic encephalitis with symptoms, including delirium, of a most fulminating character.—*Brit. Med. Jour.*, March 14, 1925.

THE centenary of the birth of Charcot was celebrated in Paris at the end of May. If plans were carried out Professor Pierre Marie delivered a eulogy of Charcot at the Academy of Medicine on the afternoon of May 26, and on the evening of the same day at a meeting at the Sorbonne, which was attended by the President of the Republic, M. Babiniski delivered an address, and was followed by the official delegates of foreign governments. Addresses were given by the dean of the Paris Faculty of Medicine, by representatives of the Paris Academy of Sciences, the Academy of Medicine, the Pasteur Institute and a number of medical societies. On May 27 a visit was paid to the Clinique Charcot and the Salpêtrière. On the afternoon of the following day the Municipal Council of Paris and the General Council of the Seine held a reception of the Royal Society of Medicine on June 15, with an exhibition in the library of books and articles by Charcot and his pupils.—*Science*, June 5, 1925.



## Editorial

### ON THE INFLUENCE OF THE LIVER ON ARTERIAL HYPERTENSION

WE are pleased to publish in this issue two contributions relative to the action of liver extracts upon arterial hypertension. We had planned that these papers would have appeared in the June issue but the time allowed was altogether too short for their proper preparation as to certain details.

One of the papers is purely an experimental laboratory study, the other might be termed an experimental clinical study. The authors of both were associated for a period and exchanged ideas although at the time working from different hypotheses.

What the ultimate benefit will be is a problem for the future, but it is gratifying to note in members of the Canadian profession not only the investigating mind but the generous cooperation with fellow workers.

We expect in subsequent numbers of the *Journal* to keep our readers well informed on this subject of liver extracts and from the pens of these same contributors.

The announcement made in two contributions, which are published in this issue of the *Journal*, of the preparation of a liver extract which will, when injected into the circulation, lower the blood pressure not only in normal cases but also even in the most marked cases of hypertension, is bound to attract attention to a signal achievement and a distinct advance in the palliative treatment of critical stages in arteriosclerosis. What this

extract is chemically is not definitely determined, although we gather that it can scarcely be of a protein character. The blood pressure is lowered in proportion to the strength of the dose used, and in consequence when the extract is not standardized an excess of it may result in collapse of the patient which may terminate fatally. In the findings of these Canadian investigators the extract appears to exercise an action antagonistic to that of adrenalin. This, however, may be more apparent than real, for adrenalin does not, according to Krogh, act on the capillaries, the tone of which is controlled by a constituent of pituitrin, a capillary hormone present in normal blood in a concentration of 1 in 1,000,000,000, and active in such dilution. The structures involved are the Rouget cells which are external to the endothelial wall of the capillary and which apparently have contractile properties. What the neutralization of this control would involve may be gathered from the fact that the capillaries in the muscles alone of a man, according to Krogh, total 60,000 miles in length, and, therefore, a slight dilatation of them would very greatly increase the blood flow through them and thus correspondingly lower blood pressure.

The chemical characters and the exact locus of action of the purified extract are consequently still to be determined. On these questions we understand our investigators are now engaged, and we shall look forward with interest to the results which they and others who may take up this line of research may obtain.

### THEORIES AND HYPOTHESES IN IMMUNOLOGY

OF all the biological sciences there is no one in which there is more instability in theory and hypothesis than in immunology. It is perhaps necessarily

so. Our present knowledge of the factors concerned in the defence against zymotic diseases is based on a number of facts ascertained in the last thirty-five years,

facts many of which have not been fully coordinated and will not be coordinated until many more have been ascertained and much fundamental investigation on the biochemical side has been undertaken. The inadequacy of our knowledge in this line has, however, not deterred speculation, as indeed was inevitable, for to refuse to resort to hypotheses when knowledge is scanty is more than has ever been exemplified, even by the keenest and most logical thinkers and observers. This has been the case specially in immunology. Some of its theories have flourished and decayed. Some of those which now prevail must, as will be shown later, be recast wholly. Of all advanced during the last four decades only one, the phagocytic, and this in a restricted sense, has stood the test of time while of those recently put forward only the bacteriophagic promises to pass muster in the years to come.

That there is this flux in theory as to immunity may be ascertained from a careful examination of d'Herelle's recently published general discussion on the subject: *Immunity in Natural Infectious Diseases*. The author, of French-Canadian origin, a researcher in immunology for more than twenty years, has contributed greatly to the science by his discovery of the bacteriophages and has this year been given, by the Amsterdam Academy of Sciences, the Leeuwenhoek Medal, awarded every tenth year to the investigator who has advanced most the progress of bacteriology in the preceding ten years, a medal which has been awarded also to Cohn (1885), Pasteur (1895), Beijerinck (1905) and David Bruce (1915). This volume is bound to attract the attention of all who wish to obtain a view point not too subservient to the *credos* of the hour. All the theories are therein passed under review and the author advances a number of his own in the way of explaining the phenomena of immunity. Some of these are in conflict with some of the facts recently ascertained, while others are not likely to have a vogue of more than a temporary character, but his conception of the part they will play is indicated when he says: "Upon the question of the intimate na-

ture and origin of antitoxins we are still able to advance hypotheses only. However, upon what basis other than the hypothetical does all biology rest?" The product must be accepted in that spirit and the reader, therefore, must adopt a detached attitude towards the interpretations of the phenomena of immunity, even when advanced by such a contributor to immunology as d'Herelle is.

Only a few of these interpretations will be dealt with now and chiefly with the object of showing how uncertain are the facts as bases for theories of immunity.

The author reduces the "specific reactions" of immunity to two classes, both colloidal, one of which is due to specific enzymes which tend to maintain colloidal equilibrium of living matter and are prophylactic in character, the other which leads to disturbance of this equilibrium, to disorganization of the micellar state of living matter, disturbances which he regards as anaphylactic. The excitants of these latter reactions may be inorganic or organic. The inorganic may tend to cause a dissipation of the electric charges on the protoplasmic micellæ and result in the flocculation ("death") of the micellar condition. The organism may, however, adjust itself, within limits, to a tolerance of the inorganic element as in the Styrian arsenic addicts. The organic, a foreign protein for example, an "antigen," reacts on the cells to produce an "antibody," a "precipitin," an "agglutinin" or a "sensitizer" which with the foreign protein results in a disturbance of colloidal equilibrium, demonstrated by flocculation or coagulation of the "antibody" and the "antigen," a coagulation not due to the formation of a new protein compound but to a loss of the electric charge on the micellæ of both antibody and antigen. A definite quantity of antibody would consequently flocculate a definite quantity of antigen. This loss of electric charge he holds is the primary factor in all these reactions and from this it would follow that any two proteins could serve, the one as antigen to the other as antibody, if each had the adequate electric charge, the charges on the two, of course, being of the oppo-

site sign. In that case, could the term "specific" be applied at all to any of such reactions except with considerable reservation?

These reactions are not necessarily in themselves defensive in character, d'Herelle holds, for they only take place *in vitro*, since in the circulating blood there is no complement which only develops or obtains when blood is withdrawn. Flocculation, therefore, cannot be a defensive reaction. That agglutination has no bactericidal significance is shown by the fact that bacteria agglutinated reproduce themselves as readily in cultures as those which have not been submitted to the agglutinated reaction. The bactericidal function other than the phagocytic must be performed by other substances than antibodies. This, of course, runs counter to the current view in immunology.

That both antibodies and antigens are proteins, the prevailing concept, has much to do in fashioning the current explanations of the specific reactions but it may be questioned whether it will hold in view of the results of recent investigations. Huntton, Masucci and Hannum have found that the antibodies in anti-pneumococcic serum are remarkably stable, are colloidal, not injured by dilute acids or alkalis, not precipitated in thirty per cent. salt solution, not affected by heat below 60°C, insoluble in ether, are

not globulins and they are not hydrolyzed by trypsin. The latter fact indicates quite clearly that if they are proteins they cannot be of the serum or tissue class. Indeed these results make it difficult to believe that they are proteins. Further, Avery and Heidelberger, of the Rockefeller Institute, who have isolated in a pure form a "specific soluble substance" from each of the cultures of Types II and III of the *Pneumococcus* organism, which yields precipitates only with the immune serum of the homologous Type, have determined that it is a polysaccharide in each case, that for Type II being dextrorotatory and that for Type III levorotatory. The specific substance contains less than 0.2 per cent. nitrogen, but this may be due to an impurity which, however, cannot be a protein as it will not give the chemical tests for proteins. This substance, however, in its purest form, is but slightly, if at all, capable of inducing antibody formation although, as already stated, it is specifically reactive with the antibody in the homologous immune serum, even when only one part of it is added to 2-5 millions of the latter.

It is clear from all this that we must be prepared, very shortly, to revise radically some, at least, of the theories and hypotheses now current explaining immunity and especially the specific reactions.

A. B. MACALLUM

## THE ANNUAL MEETING OF THE CANADIAN TUBERCULOSIS ASSOCIATION

THE recent meeting of the Canadian Tuberculosis Association, in Montreal was its twenty-fifth annual, and so celebrated the Silver Jubilee of the Association and its work. It was no more than fitting that the gathering should have been much beyond usual in numbers, in territory represented, and in variety of interests—medical, institutional, social and economic. It was certainly very fitting that there should have been an almost equal attendance of French and English speaking Canadians, voicing in the two languages

a single enthusiasm for the welfare of Canada. It is fitting also in view of the energetic campaign in Quebec that the new president should be Dr. Rousseau, Dean of the Medical Faculty of Laval University in the city of Quebec.

Especially welcome was a fraternal visit from two representatives of the Saranac School, Dr. E. R. Baldwin, head of the Trudeau Foundation, who spoke in English, and Dr. Willard B. Soper, who addressed in French an evening meeting under the auspices of *la Société Médicale de Montréal*.

There are disadvantages, but advantages as well, in a mixed conference of professional and lay workers. Technical papers have to be somewhat simplified, which might indeed be good for many medical papers. When this is done non-medical workers get some insight into the drift of medical thought, and a better appreciation of the importance of scientific research. There should be a corresponding advantage to medical men in getting the point of view of nurses who visit the homes of social workers, institutional workers, and of outstanding laymen.

Perhaps no single phase of the meeting was more encouraging than the evidence of interest in health problems and health education evinced by insurance companies, two of which were formally represented at the gathering. The Sun Life Assurance Company, which has been a liberal contributor to the health demonstration at Three Rivers, received the delegates at luncheon, when Dr. Robertson conferred a title upon its worthy president, hailing him as "anti" T. B. Macauley. The last day of the convention was spent at Three Rivers where a civic reception over which the Mayor presided was tendered to the visiting members of the Association. There was also a recep-

tion by the medical society of that city. The principles of health work and health teaching were emphasized by such leaders as Dr. Amyot, Dr. Robertson of the Canadian Red Cross Society, Dr. Lessard and Dr. Wodehouse. The papers even though addressed to a mixed audience—perhaps on account of this—were all of a high order.

The Canadian Tuberculosis Association is a mixed organization having both medical and non-medical members, and has of late rapidly extended its activities and deepened its influence. For many years it seemed but a voice crying in the wilderness, but it has gradually gained in strength and now is a very chorus proclaiming a movement for the betterment of health conditions and especially for the lessening of tuberculosis. It has done and is doing much in assisting the newer local organizations with advice and when necessary with funds; it conducts propaganda and is, especially at the present time, very active in stimulating research.

We publish in the present issue the address of Dr. Baldwin, of Saranac. In our August issue we will publish the majority of the papers read.

D. A. STEWART

## ANÆSTHESIA AND THE NEWER ANÆSTHETICS

THE problem of anæsthesia is not only one of the most important but one of the most interesting fields in medicine, and it is a sign of the progress that is being made in experimental medicine in Canada that workers in two different universities have recently contributed to its elucidation. Dr. Wesley Bourne and Dr. Stehle of McGill have been devoting themselves to the practical problems arising in connection with the older anæsthetics, and especially ether.

Chloroform has long been condemned on both theoretical and practical grounds. One of the most disquieting

features to the anæsthetist is the late deaths which occur from its use owing to its producing fatty changes in heart and liver. The suggested cause for this is that it gives rise to toxic products in the body. This type of death is very rare with ether. It does however, occasionally occur in debilitated children. The work of Bourne and Stehle, who have shown that in some conditions under ether there is a displacing of phosphoric acid radicles from the muscle to the liver during the anæsthesia, may serve to throw some light on this cause of death.

The work of these two scientists,



taken in conjunction with that of many other workers in the United States and elsewhere shows clearly that there is a definite strain thrown upon the metabolism of the body by the administration of ether which reveals itself in many ways. Ether will be always with us and will doubtless be employed in very many cases, though there is little doubt that the increased safety which arises from the gaseous anaesthetics, nitrous oxide and ethylene, will lead to an increase in their use if they are not replaced by something better.

This leads us to the consideration of the work of the other group of experimenters in Toronto. Two years ago, Dr. W. Easson Brown in Toronto in conjunction with Professor V. E. Henderson, reported on the anaesthetic properties of ethylene, which was also simultaneously discovered by Luckhardt and Carter of Chicago. As ethylene was readily available and the reports of these workers were so favourable, it has been widely employed. The

patient is rarely cyanosed as he is under nitrous oxide, but we now know that in the vast majority of anaesthetics a certain amount of oxygen want occurs with an attendant derangement of metabolism. Consequently the work of Brown reported a year ago which showed that propylene was a more potent anaesthetic attracted considerable notice among anaesthetists. Brown and Henderson have followed this up by showing that propylene will produce complete surgical anaesthesia with such a supply of oxygen that the metabolism of the animal appears to remain within normal limits, but that if there is an oxygen deficiency it has the same slight effect as ethylene. Should propylene become commercially available it promises to be the most useful gaseous anaesthetic we have, as abundant oxygen, 50 per cent. or more, may be given, and thus the body be adequately supplied with the oxygen necessary for its normal activity.

### INDUSTRIAL FATIGUE\*

THE Harveian Lecture this year was delivered by Dr. Charles S. Meyers, the Director of the National Institute of Industrial Psychology, who chose for his subject, "Industrial Fatigue"; a subject which, it must be admitted, has developed in great measure since Harvey's time. The lecturer declined at the outset to define precisely what was to be understood by the term "industrial fatigue" but went on at once to speak of the attempts which had been made to measure its amount, stating by way of apology for so doing that since we have succeeded in measuring electricity despite our ignorance of its nature, we may also by statistical methods attempt the measurement of this factor which gives rise to many disturbing phenomena met with in industry to-day.

The earliest workers in an attempt to

measure the amount of fatigue induced by prolonged labour did not concern themselves with any careful inquiry into its nature, but set about determining tests which would reveal its presence. One group of tests consisted of brief trials of efficiency applied to the worker at different times of the day or week. At first it was hoped by successive grips of a dynamometer to register the difference or lack of difference between the strength of the worker's grip at stated hours of the day. Other simple tests employed were an estimation of the keenness of sight or hearing, of the delicacy of discrimination between two simultaneous touches of the skin, or of the speed of learning, all after various forms of prolonged muscular or mental exercise. When it became obvious the worker could easily simulate fatigue and thus vitiate the value of these tests, others were introduced which were indepen-

\**The Lancet*, 1925, cccviii, 905.

dent of voluntary control. Complicating the results in all these tests, however, remained the influence of the feelings. The worker might at one time be annoyed or at another time feel relieved by any interruption in his work. Sometimes he was alarmed by the appearance of the apparatus involved, and in later stages bored by tests interrupting his work. These influences undoubtedly obscured an exact revelation of the true state of the industrial fatigue. A second group of tests were devised to test muscular fatigability by various forms of the ergograph, but here again many disturbing factors were found to influence the results obtained. Moreover the problem of whether, and if so, how far, fatigue at a given occupation was local, or general was overlooked. In view of all these difficulties the so-called fatigue tests were in great measure abandoned. Investigators then turned to a consideration of the nature of industrial fatigue, dealing first with occupations involving muscular work, and it was hoped that here our knowledge of the physiology of muscle would render valuable help. It was found, however, that ergographic tracings were not a simple record of actual conditions; and the so-called fatigue effects revealed by them were found to be largely of nervous origin, due to afferent impulses ascending from the tiring muscle and inhibiting the transmission of efferent impulses.

It was also considered that the conditions under which the industrial worker carries out his daily work are very different from those under which an ergographic record is taken. The worker does not confine himself to the use of a single muscle; he can by varying his posture bring other muscles into play to carry out the same operations. Moreover more or less unconsciously he adapts his expenditure of work to the length of his unbroken working spell or working day.

The fatigue which such a worker suffers is not merely, or even principally, a fatigue of effort, it is also largely a fatigue of skill. There is no industrial work that strictly speaking is unskilled. There are no occupations in industry in which there

are not good and bad methods of carrying them out. The best worker is he who has become expert in the use of the best movements and who co-ordinates visual, tactual and auditory sensations with such movements, synthesizing simpler previously acquired movements with one another to secure the performance of more complex movements; at the same time suppressing needless movements so as to obtain cleanness and economy of movement, and the minimal expenditure of muscular effort with the maximal efficiency of output. In time, such work becomes to a large extent automatic. When fatigue arises, however, voluntary effort has gradually to replace automatic effort and generally with much less success. Output is reduced and the expert worker falls to the level of the inexperienced worker. The value, therefore, of acquiring a proper rhythm in repeated movements can hardly be exaggerated. It is also to be noted that the unskilled and less productive worker uses the most effort and is the first to tire.

Biology teaches us the living organism is something more than a mere mechanism, and that order and direction culminating in purposeful individual minds have always to be taken into account. Industrial fatigue is primarily a breakdown in that order, a loss of co-ordination and direction; an impairment of the psycho-physiological feature which in its highest manifestation distinguishes the mental from the merely living, and in its lowest the living from the purely mechanical organization.

To what extent can rest pauses of a few minutes relieve this breakdown. In general the beneficial results of a rest pause far outweigh the detrimental ones. Rest pauses require, however, for their successful introduction a careful preliminary study of the work curves, so that their duration and the best moment for their introduction may be determined. The work curves also require study afterwards to obtain an accurate realization of the effect produced by them. When the workers have welcomed them, preferring definite organized rest pauses to irregular rest periods surreptitiously taken, the

output of work has been definitely increased. In exceptional cases they appear to have no value. The good effects accruing from rest pauses may, however, not be fully evident until time has elapsed. The worker in some cases requires time to become adapted to the more advantageous conditions of work.

Furthermore, the influence of feelings of pleasure and displeasure, and of excitement and depression, on the muscular effort of which a person is capable has long been recognized by physiologists and psychologists, but the influence of conflicting feelings on the orderly character of mental and central nervous processes has only been adequately realized after experience with the psycho-neuroses arising in the course of the war. Just as efficient muscular work demands the maintenance of a favourable posture, so efficient skilled work demands the maintenance of a favourable mental attitude. This attitude is of course maintained more easily in states of contentment and interest, less readily in states of resentment and boredom. So long as the worker is happy, a favourable attitude can be preserved without effort. Its preservation involves the successful inhibition of all antagonistic attitudes. This inhibition is apt to tire when interest fails. Discordant ideas or movements are no longer automatically suppressed, and may become manifest and inhibit industrial work. Conscious voluntary effort has to be invoked and as this also wearies, boredom is felt and the need for a change becomes imperative.

It is now realized how far the boredom arising from an uncongenial task may be safeguarded by a careful selection of the worker. Too intelligent a worker for repetitive work may prove as unsuitable as the appointment of a worker who has not sufficient intelligence for a job. Work should be adapted to the level of the general intelligence and to the special abilities of the worker. As a rule the dull worker prefers the monotonous job.

The effects of boredom are at first those of localized fatigue. Changes of muscular posture are often effective in preventing these. In some cases change in the

character of work may be as effective as the introduction of a rest pause.

One of the National Institute's investigations affords a striking demonstration of the improvement on output which may result from the alleviation of the sources of a worker's irritation, such as noise and worry. The investigation was concerned with the breakage of china in one of the teashops of a catering firm. Records were carefully taken every two hours throughout the day showing where, when, and what articles were broken. Danger points were thus revealed and removed. The investigators' attention, however, was mainly directed to overcoming the psychological causes of the breakage by diminishing discomfort, overstrain and irritation. By this means not only was a diminution of over fifty-three per cent. in the number of breakages effected, but the work throughout the day showed far better form.

At the outset of our discourse we might have been disposed to define industrial fatigue as the condition induced by previous prolonged industrial work and manifested by a diminution in the amount of output, or an impairment in its quality. Many other factors may enter and interfere with usefulness of this definition. The worker may come to his work in a fatigued state. Lack of training, the use of needless movements, and the worker's mental and physical environment either at home or in the workshop may have a greater share in producing a fatigued condition than the number of hours which he has already worked. Diminution of output as the work continues may result not only from increasing fatigue but from lack of incentive, or from boredom, resentment and worry.

In the majority of cases under present-day conditions industrial fatigue is not to be reduced by shortening the hours of the day's work, but rather is it to be combated by the avoidance of too long uninterrupted spells of work, by the introduction of carefully planned rest pauses, by change of work and posture, by determination of the best movements for

the worker, and a systematic training of the worker in those movements, and by selection of the worker so that his occupation is adapted to his innate abilities. At the same time causes of needless resentment, irritation and disap-

pointment and worry should be removed; suitable incentives to work should be introduced, and good physical and sanitary environment in regard to the illumination, ventilation, and temperature of the workroom provided.

### THERMOGENESIS AS THE FUNDAMENTAL FUNCTION OF THE ADRENAL MEDULLA AND CORTEX

IN a paper read before the Association for the Study of the Internal Secretions, on May 26, 1925, Dr. Charles E. de M. Sajous, of Philadelphia, announced that a complete revision of his earlier labours, as elucidated by modern research, had confirmed his conclusion of 1903, that the fundamental function of the adrenals was to carry on pulmonary and tissue respiration, i.e., heat production, and that the adrenal cortex took part in this process.

Sajous recalled that the leading problem of medical science, tissue respiration, was still unsolved, as shown, for example, by an editorial statement in the *Journal of the American Medical Association* (1919) that "an answer to the question as to how the all important oxidations in the body are brought about is almost as obscure to-day as it was a hundred years ago," Howell's declaration (1924) that "the respiratory history of oxygen ceases after this element reaches the tissues" and Halliburton's (1921) suggestive recognition that "knowledge of tissue respiration is so scanty that we can say but little about its pathological bearing." Sajous held, however, that there was no longer ground for the perpetuation of obscurity on these questions, so gravely concerned with our knowledge of disease, since the functions attributed by him in 1903 to the adrenals had in recent years been sustained independently by a large number of investigators, while all observers who had overlooked this function had failed to indicate any

other fundamental rôle for these organs.

Those of our readers who heard Sajous's address before the Toronto Academy of Medicine on January 5, 1909, may recall that the adrenal secretion had been regarded by him as fulfilling the rôle of a reducing substance deemed necessary by Bohr in 1891 and other physiologists to account for the ability of the blood to deplete the pulmonary air of its oxygen in strangulated animals, in high altitudes, etc. He had adduced data, based on his own investigations, clinical, biochemical and histological, also on evidence from all branches of medical science, that the adrenal secretion by acting as an oxidizing and catalytic enzyme (oxydase-catalase) carried on pulmonary and tissue respiration is so far as the participation of oxygen in these linked processes was concerned. Since then, a large number of investigators, including physiologists, pharmacologists and clinicians, have independently sustained this interpretation. They established, among others, the following facts: Adrenalin increased the intake of O, the excretion of CO<sub>2</sub> and the volume of air breathed; it was secreted in quantities sufficient to produce these phenomena; it could itself act as hæmoglobin and become converted into oxy-hæmoglobin, transform venous blood into arterial blood, raise the temperature and the basal metabolism without raising the blood pressure, it acted as a catalytic oxidase, etc.

More recently Sajous has extended



his researches to the adrenal cortex, now generally recognized as an important organ but the functions of which had remained obscure. These functions were found by him unfathomable unless they were linked with those he had attributed to the adrenal medulla. He pointed out that the secretion of the latter, the chromaffin substance, reacted with the phospholipoid lecithin of the cortex in the tissues at large, caused the liberation of heat energy therein (thermogenesis), while another familiar constituent of the adrenal cortex, cholesterol, acted as moderator of the thermogenic process by inhibiting as needed the thermogen lecithin. The red corpuscles, which, as is well known, contain both lecithin and cholesterol, were replenished periodically in these lipoids by passing through the adrenals (all the blood of the body traversing the adrenals in approximately two hours) carried them, with their oxidizing enzyme adrenoxidase, to the tissues, to sustain thermogenesis therein. The purpose of this thermogenic process was to activate the various enzymes, proteolytic, lipolytic, etc., which the tissue cells were also known to contain and which sustained the metabolic process therein by acting hydrolytically upon the food materials assimilated by the tissues. The thyroid hormone was found to play an active part in the process; that of activator of thermogenesis—the converse of that fulfilled by cholesterol.

Important as would seem a function which fills a fundamental gap of the first magnitude dating back almost to the time of Lavoisier and Laplace, the practical side of the question appears none the less so. Thus, according to Sajous, heat liberation (thermogenesis) produced as described above, is the process to which the phenomena known as "heat production," "fever," "hyperthermia," etc., still unexplained, should be attributed, "oxidation" meaning mainly, from his viewpoint that of phosphorus in the phospholipoid lecithin which all tissues are known to contain in some kindred form, cephalin in the brain, cuorin in the heart, etc., while proteins and other food products are not oxidized in the tissues as now believed, but hydrolyzed.

In the course of the discussion which followed the reading of the paper, a distinguished biochemist and physiologist, Dr. F. S. Hammett, of the Wistar Institute, stated that the dominating influence of the adrenals in bodily functions had been subjected by him to an experimental research of two years' duration, and that it had fully confirmed Sajous's views. At the Congress of Anæsthetists, on May 27th, Crile, who, with Menten, had studied in 1915, the relations between the adrenals and respiration, also obtained experimental confirmation of Sajous's interpretation of the process, referred to the pioneer work of this investigator as the dominating factor of progressive endocrinology.

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### THE GOLD TREATMENT OF TUBERCULOSIS AGAIN

A RECENT editorial in the April issue outlined the rationale of the Moellgaard treatment of tuberculous disease with sodium aurithiosulphate plus a specific serum which is obtained from horses after immunizing them with diaplyte (defatted) tubercle vaccine. The Medical Research Council

has published a preliminary report, (*British Medical Journal*, 1925, i, 735-38) of the investigations of this mode of treatment as carried out in seven hospitals in Great Britain. It seems wise to draw attention to this report in order that hopes may not be raised too high by rumours of great successes

whilst the matter is still *sub judice*. The report itself is written with studied moderation.

It may be remembered that one just criticism of the treatment (which, by the way, has not yet been finally met) was that perhaps the severe constitutional reactions following the intravenous injection of the gold salt were not due, as Professor Moellgaard stated, to the liberation of toxins from the tubercle bacilli but resulted from a directly injurious effect of the metal upon the tissues of the body. Until this question is answered we are not in a position to state whether the treatment is specific. The report tells us that "the drug does appear clinically to have a specific action on tissues infected by tubercle bacilli, and the severity of the constitutional reactions does appear to be directly related to the intensity of the tuberculous infection." It is to be noted, however, that very few control observations upon healthy individuals have been made.

About thirty patients in all were treated, of whom twenty-two definitely had tuberculous infections of the lungs. Two of these latter patients died, one a hopeless case in which death was perhaps accelerated; in the other death resulted from a toxic jaundice. It seemed that in the early cases of open tuberculosis there was some benefit from the treatment though this was not striking. Patients with more advanced disease did not stand the treatment well

and their condition was made worse and serious cases cannot stand the treatment in its present form. In one patient with tuberculous peritonitis an encysted collection of fluid disappeared at once upon treatment. Patients with other forms of tuberculosis, lupus, spinal caries, renal tuberculosis, and tuberculous glands are now being treated but are not dealt with in the report.

The general part of the report concludes with the following statements: "The evidence, therefore, despite the relatively poor results in open pulmonary tuberculosis, and that is unhappily the commonest form of tuberculosis, is sufficiently encouraging to demand further clinical study. This is particularly so in view of the one experience common to all observers, namely, that the drug seems to exert a specific action on tuberculous tissues. The Medical Research Council expects that many months will pass after the issue of this preliminary report before any further definite conclusions can be drawn. Trial on a larger scale is now justified, and it is hoped to widen the field of work with the help of more observers. But the Council is of opinion that such further trial and extended observations are imperatively required before it can be clearly stated that this gold salt is of value in the treatment of tuberculosis and before it should be made available for general use in medical practice in Great Britain."

ARCHIBALD MALLOCH

### STRYCHNINE POISONING MET WITH IN CHILDREN

**D**R. DUBLIN, in a recent bulletin of the Metropolitan Life Insurance Company, calls attention to the frequency with which accidental poisoning of children takes place. In 1924 there were recorded seventy deaths of children from one to four years of age in families who were insured in the industrial department of this insurance

company. While no less than fourteen different types of poison were ingested by these children, strychnine notwithstanding its bitterness accounted for twenty-four deaths. Various forms of lye, and rat exterminators containing arsenic, ranged next in frequency. The bulletin adds that to find so many deaths in young children from strychnine

nine poisoning is truly astonishing. Mixtures containing strychnine and cathartic pills left within the reach of infants and children were the most important sources of the poison. It would appear from this evidence that the dangers of these strychnine com-

pounds are not generally appreciated. Their deadly character for infants and young children should be made known to all parents, and more effective measures be taken to call attention to the danger of leaving medicines containing them within reach of children.

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#### GENEROUS DONATION BY THE SUN LIFE ASSURANCE COMPANY FOR POST-GRADUATE WORK IN CANADA

BY telegraph, from the Annual Meeting at Regina, comes the announcement that the Sun Life Assurance Company of Canada has offered to appropriate the sum of thirty thousand dollars for the first year's expenses in inaugurating throughout the Dominion, a post-graduate lecture course similar

to that in force in the Province of Ontario. The offer has been gratefully and enthusiastically accepted by the Association. Details of organization will require much thought and time, and readers of the *Journal* will be kept informed of progress.

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### Editorial Comments

#### ON THE VALUE OF HOLIDAYS

With the onset of spring, it may be well to bring to our readers' attention the address at Liverpool of Sir Humphrey Rolleston, Bart., President of the Royal College of Physicians, on "The Medical Aspects of Holidays." He began his address by referring to the evolution of the modern holiday from the holy days and saints days of bygone generations. Holidays, he said, were essential to the well-being of mankind, and as in the individual's life the law of fluctuation between complete activity and complete rest was physiologically necessary, so similarly in the stress and strain of life, and especially professional life, a diastolic period was needed wherein the organism might be recreated physically and mentally. He referred to the lives of Sir James Paget and Sir Henry Holland; the former took no holidays for fifteen years during his hard struggle as a young surgeon-pathologist; the latter for nearly sixty years spent two months of every year in travel. In both men the span of life was the same. Some medical men seem to keep well with no holidays and rely on walking exercise to keep them fit for work. On the

other hand he could not forget the fact that it took many holidays to ward off collapse from a medical friend who had been too preoccupied to take a holiday until a warning had aroused him to the importance of rest and change. Sir Humphrey called attention to the two different aspects of holidays; some required recreation, others rest and repair.

Every holiday should include a "complete change" from the daily routine. Its character must depend largely upon temperament and taste. A well arranged week-end habit involving bodily and mental ease may obviate the necessity of a prolonged holiday. Holidays should always be pleasurable, but may also be educative. Medical congresses were in this respect valuable. In advising patients about a health resort, Sir Humphrey thought that careful consideration should be given to the physical characters of every resort recommended. Sir Hermann Weber in arranging for his patients paid great attention to hydrology, climatology, and balneology in choosing his resorts. Holidays might fail in their object if judicious consideration were not given to these matters; patients, especially those accustomed to the ease

of home life and to little outdoor exercise, should be warned not to embark too suddenly on strenuous physical exertion.

At the opening of the summer session of the General Medical Council of Great Britain, the President, Sir Donald MacAlister\*, in his speech called attention to the following items of interest to our readers:

The Province of Saskatchewan, whose recent enactment has made it impossible for practitioners on the British Register to obtain provincial registration, while Saskatchewan practitioners still retain the privilege of registration upon the Colonial List and so of practising in this country and in British possessions overseas, has sent a reply expressing the views of its medical council. It is to the effect that there is no desire to retain British reciprocity if that involves inter-provincial reciprocity, and reciprocity with countries other than Great Britain. The Executive Committee have therefore felt constrained to represent to the Lord President of the Council that the conditions under which the Order in Council of 1915 was made have ceased to be observed by Saskatchewan, and that accordingly it is just and

expedient that the Order should be forthwith rescinded.

Correspondence with the Province of New Brunswick, where a somewhat similar question has been raised, appears to indicate that inter-provincial differences and misunderstandings are responsible for the "current discontents." The local authorities, however, plead for further consideration of the question, and deprecate the rescission of the reciprocity Order until that consideration has been given. The Executive Committee have no desire to precipitate matters with the province, and have given instructions for a reply to the provincial authorities, which shall make it clear that we agree in our desire that reciprocity with the Dominion as a whole should take the place of the present agreements with the provinces separately, so soon as the provisions of the Canadian laws render this practicable. Dominion reciprocity has long been the aim of the Council. It would bring with it a greater uniformity of provincial standards, and the elimination of local difficulties between neighboring provinces, with which the Council can not effectively concern itself.

\**The Lancet*, May 30, 1925.

#### **The Advantages of Making Several Drafts of Papers to be Published.**

—Sir William Osler said that no author ought to send anything to be printed until he had had five drafts and corrected each. This was the number Renan required. Sir Clifford Allbutt put the minimum at three, not counting the first rough note. Anatole France, about whose habits a stream of little books has been appearing since his death, said seven, with an eighth to make sure that the corrections on the seventh had been understood. In the first he enlivened what had been platitudinous. The second was for "weeding out the dandelions," who's, whichs, and whoms. In the third he eliminated the semicolons, shortened his sentences, and struck out phrases which merely linked one sentence with another, or marked a transition from one thought to another, a task that should be left

to the reader. In the fourth draft he gave special attention to the order of sentences and to the repetition of the same word; he looked on the recurrence as a warning to rewrite the sentence, not to search for a synonym. The fifth draft saw the disappearance of adjectives, for he was of the opinion of Voltaire, that though the adjective might agree with the substantive in gender, number, and case, very often it did not suit. From the sixth draft he chipped away what he called the pastry, all that was adventitious and redundant, and over the seventh draft he passed the plane, for, he said, a good writer is like a good cabinet maker—he planes his phrases smooth. France would have agreed with Byron's epigram had he known it—"Easy writing's d—d hard reading."—*British Medical Journal*, April 18, 1925.



## Men and Books

## HUXLEY'S CENTENARY

Thomas Henry Huxley was born in May, 1825, and died at the age of seventy. The centenary of his birth has recently been celebrated in England, and celebrations of this kind are gaining a significance which increases with the growing number of notable men.

Why do we so honour Huxley? He was an F.R.S. at twenty-six, with a brilliant and enduring reputation for original and sustained work in biology. He was an outstanding intellectual figure amongst contemporaries such as Darwin, Gladstone, Herbert Spencer, Tennyson, Romanes, Hooker, and Tyndall, and drew around him the keen spirits of the age; there used to be at his house in Marlborough Place Sunday evening dinners and parties "to which people from many other worlds than those of abstract science were bidden, where talk was to be heard of a kind rare in any world. It was scientific at times, but subdued to the necessities of the occasion; speculative, yet kept within such bounds that bishop or archbishop might have listened without offence; political even, and still not commonplace; literary without pretence, and even artistic, free from affectation. There and elsewhere Mr. Huxley easily took the lead if he cared to, or if challenged. Unlike some of his comrades of the Royal Society, he was of the opinion that man does not live by science alone, and nothing came amiss to him.... Yet an angry man must be very angry indeed before he could be angry with this adversary. He disarmed his enemies with an amiable grace that made defeat endurable if not entirely delightful."

And yet we do not celebrate his centenary for his fine intellectual qualities. As he himself was wont to say "Clever men are as common as blackberries: the rare thing is to find a good one."

His researches left a great impression in scientific circles, but it was not by them chiefly that he impressed, nor is it by them that his influence continues. His contemporaries were chiefly moved, Mr. Leonard Huxley has said, by "something over and above his wide knowledge in so many fields,—by his passionate sincerity, his

interest not only in pure knowledge, but in human life, by his belief that the book of nature was not to be kept apart from the ultimate problems of existence, by the love of truth, in short, both theoretical and practical, which gave the key to the character of the man himself."

To read his *Life and Letters* is to be refreshed by contact with a mind sane, vigorous and clear. His writing was a perfect illustration of Buffon's aphorism on style, *Le style c'est l'homme même*. The Duke of Wellington's definition of style was to have something to say and say it: Huxley would have himself write in such language that he could stand cross-examination on each word. To him there was no hope for the man who wrote so as to leave a loophole of escape either way. In lecturing, he always assumed absolute ignorance on the part of his hearers, and took nothing for granted. On one occasion he said to a student after the lecture, "Well, I hope you understood it all." "All, sir, but one part, during which you stood between me and the blackboard," was the reply. Huxley rejoined, "I did my best to make myself clear, but could not render myself transparent." It was Huxley who remarked, on having the valves of the heart described to him incorrectly by a student, "I never got them correctly myself until I reflected that a bishop was never in the right."

His description of a true education should be read at every opening lecture in a medical course:

"That man, I think, has had a liberal education, who has been so trained in youth that his body is the ready servant of his will, and does with ease and pleasure all the work that as a mechanism it is capable of; whose intellect is a clear, cold, logic engine, with all its parts of equal strength, and in smooth working order; ready, like a steam engine, to be turned to any kind of work and spin the gossamers as well as forge the anchors of the mind; whose mind is stored with a knowledge of the great and fundamental truths of nature and of the laws of her operations; one, who, no stunted ascetic, is full of life and fire, but whose passions are trained to come to heel by a vigorous will, the servant of a tender conscience; who has learned

to love all beauty, whether of nature or of art, to hate all vileness, and to respect others as himself.

"Such an one and no other, I conceive, has had a liberal education, for he is, as completely as a man can be, in harmony with nature."

The great teachers of this world are remembered because of their character and mental powers, and Huxley was one of these. The epitaph he wrote upon his friend Henslow may well be given to himself: "He had intellect to comprehend his highest duty distinctly and force of character to do it; which of us dare ask for a higher summary of his life than that?"

H. E. MACDERMOT

#### RACE CONTROL\*

Few realize that it was the main object of the Greeks, Romans and Arabians to destroy rather than save the majority of new-born infants, not because they were lacking in love for their offspring but because food was not always sufficient and then, too, the children were a burden in a nomadic life. In primitive society, infanticide, abortion and cannibalism were the rule. Twins were frequently killed as something uncanny; children born on "unlucky days" were slaughtered as also those born with teeth, or with a caul or other abnormality. Twins were immediately killed among Australians and the West African negro. In China, the drowning of infants, especially females, is still prevalent; this was also the case in India as late as the eighteenth century.

\*Excerpts from a paper "The History of Pediatrics" read before The Harvey Club, January, 1925.

The Arabians sacrificed their infants and even adult daughters by burying them alive. Egypt and Babylon being more fertile countries were less callous. An Egyptian mother who killed her child was condemned to hug her dead offspring for three whole days in order to experience her full measure of remorse. According to the Talmud, "if a baby boy were born, a blessing had come into the world," if a girl, "the walls wept, for a daughter is to her father a secret sorrow; care for her welfare robs him of his sleep; in her youth that she may not fade; in the time of her virginity that she be not dishonoured; in the betrothal that she be not frivolous; in her married life that she be not sterile." The Romans were among the first to show a more humane attitude towards children. They needed more soldiers and so encouraged an increase in population. In the best days of Rome, there was a tax levied on bachelors. Augustus Cæsar even relieved the fathers of three or more children from paying taxes. About 100 A.D. foundling colonies were established in which many infants were cared for by the State. In the middle ages, the many figurations of the Madonna and Child in painting and terra cotta are eloquent of an entirely new feeling toward childhood and parenthood. Church and State were united in defence of the child's right to live and thus for the first time in history, religious and civil law became one with humane sentiment. During the sixteenth and seventeenth centuries in England, wars and epidemics caused the population to become stationary. Children were frequently found dead on the streets from cold and hunger and many were fished up drowned from the sewers.

J. C. LINDSAY

**Foot Weakness and Correction.**—Dr. Wm. M. Scholl sends a pamphlet entitled "Foot Weakness and Correction for the Physician." It gives a certain number of "practical excerpts" on the etiology and mechanical treatment of weak and flat-foot, and various other common disorders of the feet. Some of the diagrams illustrating the anatomy of the arches and the manner in which the foot bears the

weight of the body, are simple and informative, and in other respects also the pamphlet contains points of practical value. It will be sent, free of charge, to any physician in Canada who will send in his request to the Scholl Manufacturing Co., 112 Adelaide St. E., Toronto.

Our remedies oft in ourselves do lie.  
Which we ascribe to heaven.—Shakespeare,  
*All's Well that ends Well.*

## Abstracts from Current Literature

## MEDICINE

**The Prognosis of Chronic Infectious Endocarditis.** Biggs, Alfred D., *Arch. of Int. Med.*, March, 1925.

The author, after a review of the literature, draws attention to the fact that all writers do not agree as to the fatality of chronic infectious endocarditis. Thayer, for example, reported 206 cases terminating fatally: on the other hand, Graham, Oille and Detweiler have observed twenty-three patients for a period of nine years, and of these, at least twenty are living. The presence of bacteria in the blood cultures of patients with endocarditis is generally regarded as indicating a grave prognosis. This idea Biggs found was not altogether in harmony with results obtained at St. Luke's Hospital, Chicago. Of fifty-seven patients with bacterial endocarditis, twenty-four are still living and many of them seem to have recovered from the heart valve infection. The other thirty-three are dead.

All cases studied by the author had positive blood cultures. The causal organism in fifty-four of the total fifty-seven patients was *Streptococcus viridans*; in one a hæmolytic streptococcus of the ordinary type; in two, an alpha hæmolytic streptococcus. Each case had a heart murmur. All had fever not explained by extracardial lesions, and many had an anæmia and the clinical signs of embolism.

The clinical progress of the patients who died, differed markedly from that of those living. This difference, the author considers, has made possible a prediction regarding the outcome, soon after the case is recognized. Those who died had a higher fever and more marked symptoms of sepsis. Twelve of the fatal cases had chills, while no chills are recorded in the cases still living. Anæmia and symptoms of embolism are more marked in the fatal cases.

The mode of onset is noteworthy. In the fatal group there is a rapid development of weakness and anæmia, with fever of the septic type, and often with signs of cardiac decompensation. A chill or symptoms of an embolus, in a few instances, is the first manifestation of the disease. The onset of the disease in the

twenty-four living patients was in no instance marked by a chill and was accompanied by a lower fever. Acute polyarthritis was more prevalent in the milder types of the disease than in those which terminated fatally.

The number of bacteria in the blood stream was greater in the fatal cases. Repeated cultures of the blood from those with the milder type was usually necessary before the specific bacteria were recovered, and even then the colonies were few.

Thirty-five of the fifty-seven patients were treated with sodium cacodylate. Three grains of a freshly prepared solution were given intravenously daily during a period of from eight to sixteen weeks. Eighteen of those treated are dead and seventeen are living, a death rate of 51 per cent. In another group of twenty-two patients not treated, seven are living and fifteen are dead, a death rate of 68 per cent. The author fails to state what the proportion of his so-called virulent types was in each group.

L. C. MONTGOMERY

**Pathological Evidence Bearing on Disease Incidence in Calcutta: Part II, Tumours, Innocent and Malignant.** Rogers, Sir Leonard, *The Glasgow Medical Journal*, February, 1925.

In this paper an examination is made of the theory that cancer is essentially a disease of civilized races, this alleged immunity being ascribed to the fact that uncivilized peoples live on "natural foods" containing more vitamins. The subject is peculiarly open to theoretical generalizations since our knowledge of the etiology of cancer is so incomplete, but it is possible to look into the statements on which such generalizations are based. It has been said, for example, that the cancer rate is eight times as high among the 500 millions of civilized races, as among the 1,200 millions of uncivilized races, including the 300 millions of India. To test the validity of such a statement Sir Leonard Rogers has analyzed a quantity of data collected by him during twenty years' work as pathologist in Calcutta, including 1,600 post mortems and microscopical examinations of 1,190 tumours. In comparison with these, he gives an analysis of 1,000 post mor-

tems and 1,000 reports of microscopical examinations at St. Mary's Hospital, London.

At first sight there seems to be a marked preponderance of the number of malignant tumours in the London series, a ratio of one to three. But the very different age incidence in the two series calls for a marked correction of the figures, so much so that the data given really show no greater incidence in the one country than the other. In the London series there is a great excess of persons of the cancer age over forty, as compared with Bengal. It is to be remembered also, in further disproof of the contention that cancer occurs more frequently in civilized than in uncivilized countries, that whatever figures are available in the latter are very considerably less reliable than in the former.

Further analysis of his series shows that both innocent and malignant connective tissue tumours are more common in Bengal than in England, whilst the reverse is the case with both innocent and malignant epithelial tumours. This is taken to support the view that the innocent forms may shade off into or take on the characters of malignant ones. The slightly lower incidence in Bengal of the malignant epithelial tumours or carcinomata is fully explained by the age factor.

Cancers of the tongue, œsophagus, stomach, large intestine and breast show considerable excess in the London series, while those of the skin, penis, cervix and body of the uterus, liver and gall-bladder are in excess in India. The great excess of cancer of the uterus in Bengal (three-fold) is probably related to the early menstruation, childbearing and menopause.

H. E. MACDERMOT

### SURGERY

**Stricture of the Ureter.** Pugh, Winfield Scott, *Annals of Surgery*, April, 1925, p. 839.

The author discusses at length the anatomy and physiology of the ureter. He asserts that stricture is much more common than supposed. There are two forms, congenital and acquired. A true stricture is a definite, permanent, pathological intra-ureteral obstruction, and is constant in its location for the individual case. The disease is more common in women, but race and social status have no influence. The ætiology in the acquired type may be (1)

traumatic; (2) infections, (3) extension of diseased process.

The traumatic cases result from childbirth, gynæcological operations and gunshot wounds. The infectious cases are the result of focal infections, tonsillitis, influenza, scarlet fever, smallpox, typhoid, pneumonia, and cerebrospinal meningitis. Tuberculosis and pyorrhœa alveolaris play an important rôle. Direct invasion by the gonococcus is a frequent cause in the author's opinion. Syphilis must also be considered. The symptoms are local and referred. The local symptoms are pain along the ureter and in the kidney. Urinary frequency and urgency and vesical and rectal tenesmus are frequent, as is also hæmaturia. The pain may be dull and aching but is commonly periodic and in paroxysms. The referred symptoms are gastro-intestinal. Chills and fever are common if urinary infection is present.

A careful history, pyelo-ureterograms, and the therapeutic result of treatment are the main factors in establishing a diagnosis. The stricture may be annular or linear, and histologically shows acute or chronic inflammatory process. Stones are commonly the result of stricture and are phosphatic in origin. The author sees no reason for assuming that stones cause stricture.

The treatment is dilatation of the ureter in addition to removal of focal infections. Operative treatment has not been very satisfactory.

R. V. B. SHIER

**Tuberculoma of the Cæcum.** Herrick, Frederick C., *Annals of Surgery*, April, 1925, p. 2801.

Hyperplastic tuberculosis of the cæcum is characterized by profuse and excessive production of fibrous tissue, and results from a near balance between the type and source of infection on the one hand and the patient's resistance on the other. The result is not a true hyperplasia, but rather a chronic infiltrating, inflammatory, granulation tissue forming process. The disease begins in the wall of the bowel and is frequently a primary lesion. The infection is carried to the cæcal wall by way of the blood stream, and is deposited in the submucosa or subserosa. The development of the process in this region is favoured anatomically.



The caecum is a stagnation point. Passage of the organisms through the gastro-intestinal tract decreases their virulence. Calmette points out the favouring influence of blood supply, while Conrath notes the proximity of the post-caecal lymph nodes, from which infection may spread to the gut wall. This latter idea is questioned by Wieting, who regards their involvement as secondary to that of the caecal wall. The presence of mixed infection in the caecum favours inflammatory reaction.

Histologically there is a huge round-celled infiltration and epithelial cell proliferation surrounding giant cells. Except for the giant cells the process may be difficult to differentiate from round-celled sarcoma.

Clinically the disease occurs in four types: (1) Those cases of insidious onset; (2) those simulating cancer; (3) those simulating appendicitis; (4) those with acute ileus.

The case with insidious onset is characterized by bloating, fleeting crampy pains, as a rule in the right iliac fossa, and occasional attacks of vomiting, and diarrhoea with mucus and sometimes blood. Cancer usually gives fewer clinical signs and is more rapid than tuberculosis. Appendicitis is distinguished by the consideration of certain factors, e.g. a history of pulmonary tuberculosis, the drinking of milk from non-tuberculinized herds. The white cell count will give a relative lymphocytosis.

The diagnostic points to remember are, symptoms of chronic intestinal dyspepsia in a young adult under forty, tuberculosis elsewhere and well resisted, partial intestinal obstruction, a palpable tumour in the caecal region, and pus, mucus, and tubercle bacilli in the stools.

The treatment advised is as follows: (a) In young adults, or in an old patient where difficulty in diagnosis is encountered, an exclusion anastomosis gives good results, or (b) resection, which in good risks gives excellent results.

R. V. B. SHIER

**Polyposis of the Colon.** Erdmann, John F., and Morris, John H., *Surg. Gyn. and Obst.*, vol. xl, April, 1925.

From statistical records there are five types of benign tumours found in the gastro-intestinal tract, viz: angiomas, fibromas, myomas, lipomas, and adenomas. The adenomas

were 25.2 per cent. of those found in the large bowel, and 63.8 per cent. of those found in the rectum. Therefore, as the distance from the ileo-caecal valve increases, so does the preponderance of adenomas.

The authors use a simple classification: (1) Adult (acquired type; (2) adolescent (congenital disseminated) type. The adult type is acquired during adult life, associated with evidence of hæmorrhage, erosions and ulcerations. They are frequently symptomless, and few in number. The adolescent type occurs early in youth. This type is characterized by intermittent profuse hæmorrhage, producing secondary anaemia, and frequently other members of the family have the disease. The whole colon from the ileo-caecal valve to the rectum is involved with the polypoid tumours.

Ewing describes these tumours under the heading "Inflammatory adenoid hyperplasia," and states that nowhere can more clearly be demonstrated the logical transition from simple inflammatory hyperplasia to tumours which are morphologically, pathologically, and clinically adenomas and carcinomas.

The authors feel that a goodly number of carcinomas of the large bowel have their origin in these polypoid masses. They estimate this at at least 40 per cent.

The treatment is very disappointing. Appendectomy and cæcostomy have been advocated and may give some temporary relief. The authors hope that further development of x-ray therapy may be of some avail. R. V. B. SHIER

#### **A Case of Death from Spinal Anæsthesia.**

(Un accident mortel de Rachianesthésie). Barwaltet, H., *Bull. de la Soc. de Pathologie Exotique*, March 11, 1925, p. 294.

The patient was a native boy of between ten and twelve years of age. He was suffering from a large chondrolipoma of the thigh. Except for this he was in good health. He was given an intraspinal injection of allocain and adrenalin. Half an hour later it was noticed that he was "forgetting to breathe." Two hundred and fifty cc. of physiological saline, 2 cc. of ether and 5 cc. of camphor oil were given subcutaneously. Ten minutes later he became comatose. One half cc. of adrenalin was given hypodermically and later another half cc. was injected directly into the

heart. Artificial respiration was maintained until the heart stopped an hour later. This was the writer's first case of death in 2,000 cases operated upon under spinal anaesthesia.

W. B. HOWELL

**Three cases of Resuscitation after Syncope due to Anæsthesia.** Trois cas de Reviviscence du cœur après syncope anæsthesique, l'une definite, les deux autres temporaires, par l'injection intracardiaque d'Adrenaline. Tasso, Asteriades, *La Presse Médicale*, May 13, 1925.

The appearance of the patient in "syncope blanche" is unmistakable. Artificial respiration is useless until some adrenalin has been injected directly into the heart, and its beat aroused. The injection should be done with a lumbar puncture needle and is quite harmless. The best site is either in the third or fourth intercostal space close to the edge of the sternum.

The first of the writer's cases was a soldier twenty-two years old, undergoing an operation for inguinal hernia under chloroform anaesthesia. The heart's action suddenly stopped. A quarter of a milligramme of adrenalin was injected into the heart. Two minutes later the heart was beating vigorously. Respiration recommenced in five minutes. Twenty-five minutes after the syncope the operation was resumed under chloroform and completed. The patient's convalescence was uneventful except for vertigo and a slight acceleration of the pulse (100-110) during the first two days.

The second case was that a child five years old who was operated on under chloroform anaesthesia for osteosarcoma of the lower jaw. Heart and respiration stopped just after the operation was completed. Two direct injections were made into the heart, the first eight minutes after the syncope, but the result was only a few feeble beats.

The third patient was a woman aged twenty-eight with peritonitis. Syncope occurred during the sewing up of the peritoneum. The heart was massaged through the diaphragm. Ten minutes after the onset of syncope one-quarter milligramme of adrenalin was injected and three minutes later this was repeated. The only result was to evoke a few feeble beats.

W. B. HOWELL

## PÆDIATRICS

**Clinical Observations on Craniotabes and Rickets.** Wilson, S. J. and Seldowitz, M., *Amer. Jour. of Dis. of Chil.*, May, 1925.

These authors studied one hundred and sixty-four cases of craniotabes and found the association of this condition with rickets to be very inconsistent. Craniotabes occurs earlier than rickets and its occurrence is markedly seasonal, the greatest number of cases occurring in May, June and July; most cases being cured during August and September. Exposure to sunlight has a markedly beneficial effect. The author suggests that the season, rather than the age, is the main factor in the disappearance of the craniotabes.

R. R. STRUTHERS

**Parenchymatous Nephritis:** I, As a General Systemic Disorder; II, Infection of Paranasal Sinuses as Etiology; III, The Surface Tension of the Blood Serum. Clausen, S. W., *Amer. Jour. of Dis. of Chil.*, May, 1925.

Parenchymatous nephritis is featured by marked oedema and albuminuria and the absence of hæmaturia, hypertension and retention of non-protein nitrogen. The microscopic changes in the kidney in early cases are confined to degeneration of the tubules; in later cases are observed infiltration of round cells. Infection is the chief cause of death and the author noted that all cases were peculiarly susceptible to infection. Parenchymatous nephritis is a general disorder, caused by a focal infection with staphylococcus, leading to widespread tissue injury with a lowered resistance to further infection and a depletion of body protein. The indications for therapy are to remove the causative infection and restore lost body protein.

In the second paper Clausen presents evidence to show that staphylococcus infection of the paranasal sinuses plays an important etiological rôle in parenchymatous nephritis. This infection was invariably found in a series of unselected cases, exacerbations of the infection were accompanied by exaggeration of the symptoms; successful treatment of the infection was followed by improvement or cure; other forms of treatment were of only temporary benefit, and in other forms of nephritis sinusitis is not regularly present.

The treatment of sinus infection is not the only necessary therapeutic measure. A diet low in salt and composed of milk and fruit is given, and other proteins such as casein, salt-free cheese, eggs and meat are gradually added until 2.5 to 3.5 grammes of protein per kilogram of normal weight is being given. Sugars and starches are added until the caloric value of the diet reaches sixty to eighty calories per kilo. The so-called eliminative treatment is not effective in producing diaphoresis or diuresis while infection persists; after treatment of the infection it is usually unnecessary. Fluids are not restricted and purgation is unjustified.

In the third paper Clausen shows that in parenchymatous nephritis there is a marked diminution in surface tension of the blood serum, and that as the surface tension of the serum returns to normal, the albuminuria of parenchymatous nephritis decreases. The surface tension was estimated by the so-called drop weight method. There is also a marked lowering of the serum protein of the blood as determined by the refractometer and the oedema is correlated with the low serum protein.

R. R. STRUTHERS

### OPHTHALMOLOGY

**Tints and Their Value.** Lawson, Sir Arnold, *Brit. Jour. of Ophthal.*, March, 1925.

The promiscuous use of tinted glasses is harmful. The author attributes the fashion of wearing tinted glasses to the bugbear of ultra-violet rays on the one hand, and, on the other, to over-advertisement.

The eye is self-adapted to endure without harm ordinary daylight, which consists of the luminous rays of the visible spectrum, the ultra-violet or chemical rays, and the infra-red or heat rays. Artificial light is not stronger in ultra-violet radiation than daylight.

Under ordinary circumstances ample protection from ultra-violet rays is given by the cornea and the lens, chiefly by the latter. Protection from the infra-red rays is afforded by the pigment lining and the contracting power of the pupil; but it is not such efficient protection as that against ultra-violet rays.

There are, however, extraordinary circumstances under which it is advisable to wear tinted glasses:—

(1) *Intense and prolonged exposure.*—In the sunlight of high mountains and of tropical plains the danger is chiefly from the infra-red rays. Peacock Blue is the best protection, but is depressing. Crookes and London Smoke are also good.

(2) *Glare.*—Glare is additional light reflected from snow, water, etc. Snow reflects 70 per cent of existing sunlight. As the natural protection from infra-red is less than from ultra-violet, it is assumed that snow-blindness is due to the direct scorching of the conjunctiva by the former, and eclipse blindness to direct scorching of the retina. Peacock Blue gives the best protection.

(3) *Occupation.*—Acetylene welders are exposed to intense ultra-violet. Peacock Blue and deep Fieuzal tints are best. Amber is inefficient. Glass-blowers and foundry workers are exposed to much heat radiation. Peacock Blue gives the best protection. Deep shades of Crookes and London Smoke are also good. Amber is inefficient.

(4) *Pathological conditions.*—Those with healthy eyes but who are physically and mentally abnormal sometimes appreciate tinted glasses. The kind of tint is immaterial since it is mere shade that is desired. Avoid a depressing shade and discontinue as health improves, to prevent a habit which may become pernicious. Crookes A is recommended. (b) In all cases of cataract, especially the early stages, tinted glasses for bright light or glare should be ordered. Crookes glass is admirable; for reading Crookes A is best. (c) The apsidic eye, on account of the absence of the protecting lens, needs tinted glasses constantly, except on dark days. Further, the strong convex lens usually worn may act as a burning-glass. Crookes A or light London Smoke or Fieuzal are suitable. (d) In active inflammatory disease of the retina and choroid, Peacock Blue is much to be preferred as it shuts off entirely all ultra-violet and infra-red rays and a large proportion of the luminous rays as well.

S. O. McMURTRY

## Miscellaneous

### GORDON BELL MEMORIAL LECTURE

Lecture Theatre A. of the University was crowded on the night of April 3 to hear Prof. M. P. Ravenel, of the University of Missouri, deliver the second Gordon Bell Memorial Lecture.

In beginning his address, Dr. Ravenel, who was a personal friend of Dr. Gordon Bell, paid a warm tribute to him as a naturalist, a sympathetic physician and a humanitarian. Public health in its broadest application had been one of Dr. Bell's chief interests, and the subject discussed was the prolongation of life with its effect on population, food supply, and man's relation to his fellow man. In many parts of the world, he said, modern conditions of poverty and unemployment had made birth control the burning question. The idea was gaining in popularity among many of those classes which have in the past bitterly opposed even its public discussion. The constantly increasing poverty and disease with which the world is afflicted to-day will only fall before the weapon of birth control. At the present time the least valuable of the human stocks were those who propagated the most excessively. People whose mentality and physique are most worthy of preservation by propagation were failing in their duty to the world and allowing their species to die out. One of nature's most important laws, that of the survival of the fittest, or the elimination of the weakest, has been suspended by man. Protective laws and humanitarianism tended to justify the existence of the weak and incompetent. These people were being allowed to increase and they were becoming an enormous burden on the healthier section of humanity. Animals have no parasites, and were he living under natural conditions, man would have none either. Nature thinks only of the preservation of the species and sacrifices the individual who menaces this preservation.

With the beginning of Christianity came protection for the unfit, and the beginning of the world's present burden. The ideal social fabric would be that which combined the best features

of the two viewpoints, he believed. There are many allegations made against birth control that are perfectly just, he admitted. One of the objections that has been advanced against the teaching of birth control methods is that they would be used for immoral purposes, and that, he thought, was undoubtedly true. Also there was the danger that while birth control might diminish the propagation of weaklings and mentally deficient, it might at the same time lower the birth rate of exceedingly desirable specimens of humanity. Nevertheless, he believed, some measures would have to be taken if the problems which will be engendered in the future by over population of the world are to be met and overcome. Unrestricted propagation carried on for only a few more generations would lead to such a terrible situation that all humanitarian considerations would be dropped, the speaker stated. "Humanitarianism is only skin deep," said Professor Ravenel, "and when the crisis appears it will rub off. The instinct of protectiveness towards the weak will disappear when the world's food supply becomes insufficient."

Statistics gathered from most of the civilized countries of the world were read by Professor Ravenel to prove the folly of allowing mentally deficient people to increase. It has been proved almost beyond doubt, that weak-minded children in most cases inherit their defects from parents who are in some degree sub-normal mentally. According to its present rate of growth, the population of Canada will double in twenty-four years from natural increases. At the same rate the United States will double in about thirty years. The entire population of the world will be twice as large as it now is in sixty years' time. The most optimistic of investigators say that the United States can support 300 million people. Many others held that the possibility was much smaller. Therefore, in a comparatively short time the United States would be greatly overpopulated. Statesmen like Lloyd George and others equally prominent who prophesy a population of a billion-and-a-half for the United States and half-a-billion for Canada are talking about



something of which they are ill informed. In many parts of the world the food supply is a serious matter even to-day. Many sections have been swept by famine within the last few years, and these conditions would increase as the world grew more populous unless some measures were taken to stem the enormous increase in the number and poor quality of children being born. The adoption of birth control is to be preserved.—*Manitoba Medical Bulletin*, April, 1925.

#### WORLD PREVALENCE OF HUMAN PLAGUE DURING 1923

In a recent United States Public Health Report\* a summary is given of such information as is available regarding the world prevalence of human plague. Whilst there are relatively long intervals between outbreaks in America, it should not be forgotten that there exist endemic plague areas on this continent, and the outbreak in Los Angeles, Calif., of both bubonic and pneumonic types, emphasizes the possibility of an epidemic as long as infected rodents exist, and the necessity for a persistent campaign against this source of the disease. It is difficult, however, to collect complete reports from all countries, in spite of the fact that the disease is universally notifiable, and it is quite likely that many localities where sporadic cases and even outbreaks have occurred, are not included in the available data.

Three interesting points are brought out by the compilation:—(1) The total incidence of the disease; (2) Its world-wide prevalence; (3) The existence of not one or two, but several, endemic areas.

Only a crude estimate as to the mortality can be given, and this shows that for the year 1923 a total of 255,362 deaths from plague were reported from all parts of the world. Where both cases and deaths are reported, however, the fatality rate indicated is 65 per cent, suggesting the much higher total of 384,000. Over 90 per cent of the cases occurred in India, but there have been much higher losses in other years; in 1906-7 for example, there were over 1,000,000, and even in 1917-8 the figure was over 800,000.

The fact that there is an endemic focus of plague in the United States is significant of the spread of such foci in recent times, for it seems likely that such spreading has only taken place within the last half century. It is pointed out that mere reports of deaths or cases does not necessarily establish the existence of foci in those areas; there would have also to be careful surveys of possible animal and insect carriers of the disease. Sporadic cases arising from endemic infection would also have to be distinguished from those that were imported. Still, if even a conservative estimate is made, based on localities from which more than ten cases or deaths were reported, the number of possibly endemic centres will be surprisingly large.

India and Egypt show a greatly increased prevalence in 1923 over that of recent years, and in several other localities there was a greater prevalence in 1923 than in 1922. In Australia, however, there was one case in 1923 as against forty-six in 1922, and in Japan one case as against 118. The difficulty of dealing with the situation in India is well described by Dr. Norman White. He points out that the heavy rainfall at certain seasons ensures conditions favourable to the epidemic evolution of plague. "High atmospheric humidity at certain temperatures ensures conditions favourable to the development of the rat flea. There are also indirect effects: in the Punjab and the United Provinces it is a common practice to hold up stocks of grain until the winter rains are well established. If the rains be plentiful (with consequent high humidity) and the agricultural prospects promising, large quantities of grain are liberated and exported at a time when meteorological conditions are most favourable to the spread of plague. The added facilities thus afforded for the rapid diffusion of plague infection, by means of grain coming from and going to the rat-infested granaries of northern India, are of very great importance.

"Taking all facts into consideration, there is unmistakable evidence that the prevalence of bubonic plague in India is on the wane. The plague situation in India is not so unmanageable as it was a decade ago. The danger spots in each province are known—places in which infection persists, and from which infection

\*Public Health Reports, U. S. Public Health Service, Vol. 40, No 5.

spreads year after year. The dangers inseparable from the rat-infested markets and grain stores.... are beginning to be realized. The uncontrolled traffic in grain and other rat-favoured merchandise still continues, however, to exercise its baneful influence, though each year provides striking evidence of the harm done."

Peru must be regarded as an important endemic area, since 408 deaths and 870 cases were reported in 1923 from eight centres in that country.

As regards the severity of the disease, it has been suggested that the comparatively high ratio of cases to deaths indicates a relatively mild form, but it must also be remembered that there is now a better system of reporting and more effective treatment.

H. E. MACDERMOT

#### MALARIA CONTROL IN PALESTINE

It is always interesting to learn of campaigns against malaria, especially where large areas are concerned. The control of malaria in Palestine affords an instance of what is being done by organized and scientifically directed effort, the organization being the Haifa Malaria Research Unit, maintained by the American Joint Distribution Committee and acting in co-operation with the government of Palestine, the unit being under the control of Dr. I. J. Kligler. We have received his report for 1923.

The main idea of the unit is to establish malaria control on an extensive scale at low cost. Collection of data regarding the prevalence of the disease, types and breeding places of the mosquitoes concerned, etc., have gone hand in hand with the education of the public in regard to controlling the disease, and, as is remarked in the report, the value of this education is probably as important as the immediately practical results obtained.

The unit was specially active in the permanent elimination of breeding places. First the swamp areas were methodically surveyed and then cheap and effective methods were devised for their eradication. The chief methods employed were drying by intermittent damming of streams, and cleaning pools with or without larvicides. The statistical tables show that there was a marked decrease in malaria incidence following the application of these measures.

Quinine prophylaxis was only employed temporarily when mosquito control had broken down.

H. E. M.

#### INDUSTRIAL HYGIENE IN MOSCOW

The condition of industrial hygiene in Moscow is the subject of a report published in the *Journal of Industrial Hygiene*, February, 1925, by Dr. Alice Hamilton and Rebecca Hilles, of the Harvard Medical School and New York State Department of Labour. Their visit to Russia was at the invitation of the Soviet Health Department. They were struck by the progress made in Russia in the matter of preventive medicine; in spite of the country only having been at peace for a little over two years there still "is no city in America so well equipped to protect its working population against the dangers of industry and to care for them when they fall victims to these dangers as is Moscow."

There is an Institute for Occupational Diseases which receives patients whose troubles seem to be of occupational origin, and attached to the institute are a number of physicians who are making intensive studies of various trades. Another institute is devoted to sanitary hygiene, under the charge of Levitsky, who has been an outstanding figure in industrial hygiene for many years. He has been trying more particularly to remedy conditions in the felt hat industry. This has always been largely a home industry, the factories which were gradually growing up having been closed during the war. It is therefore very difficult to introduce new methods amongst the workers, many of whom still follow the primitive methods by which the skins are treated with acid nitrate of mercury and are then allowed to dry and ripen in the living rooms. Later in the process the fur so treated undergoes heat and kneading, in the course of which the mercury is volatilized. By the more modern method which Levitsky is striving to introduce, potassium hydrate is used instead of the mercury, but its use requires more skill and care, and the peasant is only slowly being persuaded to make the change.

One of the university medical schools possesses a dispensary and clinic for occupational diseases, devoted to the teaching of students, and industrial medicine is a requisite in the medical

curriculum; an account is given also of an interesting Museum of Safety housed in the former palace of the Galitzin family. "The Museum is admirably planned for instruction, especially of the workingman... Each trade is pictured as far as possible, or the apparatus displayed, and there are denominations showing the dangers inherent in the trade and the methods of protection. One whole room is given over to anti-alcohol propaganda, although prohibition is not absolute in Russia, for beers and wines are allowed, with apparently no restriction on the alcohol content of the latter. At certain times the government stops the sale of all liquor, such as during the three-day holiday celebration of the Revolution."

Great efforts are being made to increase factory production throughout the country, but apparently there is as yet no corresponding improvement in the physical conditions of factory production, which are far below American standards. It is pointed out, however, that on the whole the worker's welfare is considered to be more important than what he produces, and therefore, there is less difficulty raised in the investigation of industrial hazards. "There is no question of a sensitive or hostile employer, or of an Argus-eyed industrial insurance company."

#### AN ASPIRATOR

We have received from Dr. Daniel McLellan of Vancouver, a description of an apparatus designed by him for aspirating body fluids, with the exception of thick pus. A 30 c.cm. Luer syringe is connected by an adapter and rubber tube to the stem of a Y-shaped glass tube. A Luer aspirating needle is connected by an adapter and rubber tubing to the receiving arm of the Y-tube, and to the discharging arm is attached a longer section of tubing. Between the needle and the receiving arm is a glass valve, permitting fluids to enter; a similar valve between the discharging arm acts in the opposite way permitting exit to the long discharging rubber tube. As the piston is drawn up the valve in the receiving arm opens, so that fluid can be drawn up, and as the piston is pushed down the valve closes, preventing the passage of fluid backwards through the needle while the valve in the long arm opens under pressure.

In aspirating pleuritic fluid the procedure is as follows: The patient having been prepared, the apparatus is filled with normal saline so as to expel the air, by means of a few strokes of the syringe. A clamp (B) is then placed on the long tube to prevent the fluid running off. The exit end of the long tube must not be left standing open: there should be an adapter of the same calibre as that in the receiving end. To ascertain if the needle, after being inserted into the chest is actually in the fluid, connect the syringe direct with the needle, draw up a small quantity of fluid, thus proving the point, then connect up with the apparatus and proceed to evacuate the fluid with easy steady strokes, the clamp being first removed.

A demonstration of the apparatus was given on a patient at a meeting of the Vancouver Medical Association in November, 1924. It is in use at the Vancouver General Hospital, and at the Rotary Clinic for Chest Diseases, Vancouver.

The Canadian Surgical Supplies Company of Vancouver are handling the apparatus for Canada.

#### INFRACTION OF THE LIQUOR LAW OF ALBERTA

*Court Decisions.*—On an appeal from the conviction of a magistrate for violation of the Liquor Control Act of Alberta, two members of the College won their appeals.

One was convicted for giving a patient liquor to take home with him to be taken as directed. The magistrate contended that administering meant actually giving the medicine to the patient in the doctor's office to be taken then. In reversing this decision the District Judge stated that administering could mean prescribing and if necessary giving the patient liquor to take home with him to be taken as directed and further he thought that twenty-four ounces should not be considered an unreasonable quantity to prescribe.

It is well to note here that if another similar case comes up based on the district judge's decision we are informed that the department intends to appeal the decision.

The second case was where a doctor had a portion of a bottle of liquor in his office, said bottle having been purchased on a special permit in 1924, but some remained unused in 1925. The doctor was fined for having liquor in a place other than a residence. In reversing this

decision, the district judge said: "It seems only reasonable that if a physician is permitted to administer liquor to a patient, that he should be allowed to have the liquor in his dispensary, providing he obtained it under a special permit as was done in this case, and I do not think that the fact that the liquor was purchased in 1924 under a 1924 special permit, especially when the doctor held a special permit for 1925, would have any bearing on the case."

*Fined for Negligence.*—Recently a Supreme Court judge allowed a considerable sum of damages to a patient and her husband, against a doctor who was the physician in charge of a maternity case. The judge sat as jury as well and found on fact that a third degree tear took place at childbirth and was not noticed and therefore not repaired at the time, consequently he found the doctor guilty of negligence and responsible for damages in not noticing what an ordinary practitioner would be reasonably expected to notice. He did not release the doctor from responsibility because the doctor's instructions were entirely ignored and no skilled nursing attention was given, and the doctor was 1,000 miles away during the convalescence, nor did he accept the evidence of the defence that unsanitary conditions, careless nursing and inexperienced attention aggravated a tear that was repaired.

The case was appealed and the original decision was reversed, and the doctor exonerated.

The reasons for reversing the decision are as follows:

Careless nursing, lack of medical supervision in convalescence suggested by the physician, who had to leave, but not followed by the patient who could well afford to call someone, improper giving of enemas and opinion evidence by men three weeks later as against fact evidence by those present at the time. Opinion evidence that a fistula could develop from wrong care followed by lack of intelligent care.

*Negligence.*—A patient took action against a doctor for damage from the application of quartz lamp claiming a burn from the treatment which afterwards caused gangrene necessitating the amputation of a leg.

The trial judge in Edmonton gave judgment against the doctor and granted damages to the plaintiff of \$3,500.00.

On the appeal case in Edmonton two of the judges were for vindicating the doctor; this was not done but the damages were reduced to \$2,000.00.

The case was taken to the Supreme Court of Canada at Ottawa, and there the decision was favourable to the doctor, completely vindicating him, establishing the fact that the quartz lamp did not cause the damage.

The following abstract from *Science*, (June 5, 1925) may prove of interest:

"A sixth seismograph station, which will assist in the work of those maintained at Saskatoon, Halifax, and Ottawa, by the Dominion Observatory and at Victoria and Toronto by the Meteorological Service, has been established at Ste. Anne de la Pocatière, Quebec, by the Department of the Interior. The new station is situated near the center of the area affected by the earthquake of February 28. The Dominion Observatory does not anticipate any further serious shocks, and the object of the installation is to study better the slight tremors which may occur from time to time in this area as a natural consequence of the more intense quake, as well as to secure a seismological record for this part of Canada.

The major disturbance of February is still under investigation by the seismologist of the Dominion Observatory. In reply to a query in the House of Commons recently, the Honorable Charles Stewart, Minister of the Interior, presented an interim report on the earthquake investigations, which in part was as follows:

As in the case of all earthquakes of any considerable intensity, the main shock has been followed by a series of minor ones which are still felt at intervals. Earthquakes have occurred before in this region, the last severe one about half a century ago. Now that the accumulated stresses have, in all probability, been relieved, there is no occasion to anticipate further serious disturbances during the present generation. As an insurance for posterity, however, it would be well to pay some attention to location and methods of construction of new buildings. Where these are massive, and of stone or concrete construction without reinforcement by steel girders, it is preferable to have the foundation on rock or other solid substratum. Wooden or steel reinforced buildings are safe.



## Medical Societies

### FOURTH INTERNATIONAL MEDICAL CONGRESS OF INDUSTRIAL ACCI- DENTS AND DISEASES, AMSTER- DAM, SEPTEMBER, 1925

The British Committee of the above Congress, of which notice has already appeared in a previous issue, has now been completed and is composed as follows:—Honorary President, the Minister Plenipotentiary of the Netherlands to the Court of St. James, Jhr. Mr. R. de Marees van Swinderen; President, Sir Thomas Oliver; Vice-President, Professor E. L. Collis; Honorary-Treasurer, Dr. C. S. Thomson; Honorary-Secretary, Dr. H. Menko.

The Congress will meet on Monday, September 7th and will continue until Saturday, September 12th. An attractive programme has been arranged. There will be two Plenary Sessions, one after the opening and the other towards the close of the Congress. The sections will meet on the other days. Men, well known in the field of industrial diseases and accidents, will read papers. Every effort is being made to make it an international success. As it is the first con-

gress since the war, the British Executive Committee begs to express the hope that the British section will take a leading place in the deliberations. It is also hoped that Canadians interested will take part in the proceedings.

The cost of a ticket for each member will be £15; this includes admittance card to the Congress, return ticket to London (the return journey may be made at the member's own time within one month), room and breakfast in one of the leading hotels in Amsterdam, admittance to the Congress dinners, official receptions, etc. Further information can be obtained from the Honorary-Secretary, Dr. Herman S. N. Menko, 2 Grosvenor Gardens, Cricklewood, London, N.W.2.

The following subjects will be discussed: Accidents and Diseases from the Medical Point of View (France). Diagnosis and Outline of Occupational Diseases (Germany). Accidents and Diseases from the Medical Legal Point of View (England). Reinstatement of Permanently and Partially Disabled Workmen (Holland). Accidents and Tuberculosis (Switzerland).

**Mechanism of Formation of Sarcoma.**—The mechanism of the formation of a tar sarcoma is explained by Alexis Carrel, New York, in the following manner: When coal tar, or a principle resulting from the action of tar on some constituents of the humors or tissues, affects cells in the process of division, such as embryonic cells or macrophages, a substance is formed which is analogous to that described by Rous. This substance, like the lytic principle of Twort, has the power of determining a special disease and eventually the death of certain cells, and at the same time of reproducing itself. Possibly there is no other relation than an analogy between the two phenomena. But, like bacteriophage, the filtered extract of either Rous or tar sarcoma determines within the cells of a phenomenon that reproduces itself indefinitely. Tar sarcoma appears to be

a self-perpetuating disturbance of the metabolism created by the action on embryonic cells of a substance related directly or indirectly to coal tar. A similar phenomenon may bring about the formation of other tumours. It is possible that certain substances produced by bacteria and helminths, or resulting from roentgen-ray burns, determine in macrophages and other cells, as does coal tar, a disturbance that afterward propagates itself indefinitely. By a similar mechanism, the toxic substances normally present in the blood during adult life and old age might act on the dividing cells of an irritated area as does the serum of tar-injected chickens on embryonic pulp. This simple process might be responsible for the spontaneous production within the organism of malignant tumours.—*Jour. Am. Med. Ass.*, June 13, 1925.

## Obituaries

**Dr. D. O. Alguire**, former member for Stormont County, died in Cornwall on May the 4th. Dr. Alguire graduated in medicine from McGill in 1873 and had celebrated his 50th anniversary as a doctor. He had been keenly interested in municipal and religious work as well as in medicine and had represented the county in the Dominion House for many years.

**Dr. George W. Aylesworth**, of Collingwood, died at Trenton on April the 14th. Dr. Aylesworth had practiced at Collingwood for fifty years after his graduation in 1869. He was well known in the profession and had also been much interested in civic and educational matters. He is survived by one son, Dr. R. B. Aylesworth, of Trenton, and two daughters.

**Dr. James Mortimer Clark**, a missionary of the Canadian Methodist Church in China, died of typhus at Chung-king. Dr. Clark was the son of Mr. and Mrs. Thomas Clark, of Ballyduff, Ontario. He was a graduate of Queen's University and had a long service with the Army Medical Corps in England and France.

**Dr. Charles B. Cornell** died in Brockville on May the 8th where he had practiced since 1889. One of the best known of Queen's graduates, he had been well known in the district as one of the most prominent surgeons of central Canada.

**Dr. G. A. Elliott** died in Toronto on April the 26th in his 57th year, he had practised formerly at Cedar Springs, Walkerville and Windsor.

**Dr. Moffit Forster** one of the oldest graduates of the Toronto school of medicine died early in May in his ninety-fifth year. Born in Streetsville in 1831 he studied medicine under the guidance of Dr. Freeman, of Georgetown, and later graduated from the old Toronto school in 1865. Dr. Forster practiced first in Thorndale and then in London, and afterwards in Kitchener and Palmerston; he retired from active practice in 1907. Dr. Forster was one of the few remaining links connecting us with the days of the old Toronto school; one of the pioneers of medical practice in Upper Canada, it is interesting to note that he had conducted a milling business before devoting his time to the study of medicine.

**Dr. John William Gannon**, of Reserve, Nova Scotia, died on the 6th of June, after a short illness. Dr. Gannon graduated at McGill, in 1918, and immediately enlisted in the Army Medical Corps. After demobilization he took up practice at Reserve, where he quickly won the confidence and respect of a large clientele. He was thirty-five years of age.

**Dr. William Logie**, Medical Officer of Health for Sarnia, died in that city on April the 20th. Dr. Logie had always been a leading figure in medical and municipal matters; he was the sponsor of the Lambton County Health Week, and member of the Board of Education and had been mayor of the city in 1901 and 1902.

**Dr. J. A. MacIntosh** died in Chippawa on May the 12th in his 41st year. Dr. MacIntosh was a son of Dr. J. D. MacIntosh of Vankleek Hill. He was a graduate of McGill in 1913 and practiced at Vankleek Hill before moving to Chippawa.

**Dr. F. H. Powell**, one of Ottawa's prominent physicians who had been suffering from a severe breakdown for many months was found dead on May the 4th. A graduate of McGill in 1885 and L.R.C.P. London 1886, Dr. Powell had long been associated with Ottawa's medical activities.

**Charles Roberts**, for over thirty years the Canadian Manager of the J. B. Lippincott Company of Philadelphia, died suddenly at his home in Montreal, a victim of apoplexy. Few book agents in Canada have been so widely and favourably known as Mr. Roberts. The *Journal* has a special obligation towards him as he acted for some years as agent for it throughout the Dominion. Charles Roberts was everywhere respected; an excellent salesman whose word could be depended upon. He was always seen at our annual meetings in charge of the bookstall of the Lippincott Company and a chat with him on medical books was ever a source of pleasure and of information. The funeral took place in Hamilton from the house of his brother, Dr. James Roberts, Medical Health Officer of that city.  
A. D. B.

**Dr. George Strathy** died on June the 11th. By his death Toronto lost one of its ablest physicians and one of the finest types in the profession. Dr. Strathy had been ill for three weeks developing finally a purulent pericarditis. For this resection of the ribs for the draining of the pericardium was attempted. Even the best of constitutions with the ablest skill on the part of his attendants could hardly hope to subdue an affection of this sort. A biographical note which will deal more fully with his many activities will appear in another issue.

**Dr. John Henry Wright**, of Alexis Creek, Chilotin, B.C. died in Vancouver on June 1st, at the age of seventy-three. Dr. Wright was a native of Scotland, a graduate of Edinburgh University, and came to this province eleven years ago. He leaves a wife and a son, William, to whom our deepest sympathy is extended.

It is with regret that we record the sudden death of Miss Jean Warrender, a nurse on the staff of Shaughnessy Military Hospital. Miss Warrender went overseas from Kingston, Ontario, early in 1916. After a short time at Taplow, Miss Warrender went with No. 7 General Hospital to France and served there till the end of the war. She was one of the last nursing sisters to leave France in 1919. Her death occurred from heart trouble (for which she was in receipt of a small pension) while serving tea to the patients in Shaughnessy Hospital. Miss Warrender was an Old Country Graduate from Aberdeen. She was buried with full military honours on June 6th.

## Medical News from the British Empire

### GREAT BRITAIN

We learn that Sir John MacAlister has been compelled on account of ill-health to resign the office of secretary of the Royal Society of Medicine, an office which he has held since 1887 and has discharged with high qualities of ability and devotion. He took a large part in organizing at Christmas, 1918, the post-graduate courses in London, which, during the first half of the following year met the needs of a large number of medical officers then in process of demobilization, including those of the Australian, New Zealand, and Canadian armies. Those of us who were in a position to avail ourselves of these welcome (and welcoming) courses appreciate fully the completeness of detail with which they were arranged.

The *Journal* would add an expression of its best wishes for Sir John's early and complete restoration to health and vigour.

H. E. MACDERMOT

A great extension of national health insurance has been proposed, and is steadily progressing towards acceptance by Parliament. By this scheme over seventy per cent. of the population will be covered. It is to be compulsory and contributory, and will call for additional contributions from both the workman and the employer of eight cents a week each, and four cents in the case of working women and employers. Before the entire amount of these contributions can become available, however, the state proposes to put the whole scheme into force, although involving as it does the enormous sum of \$375,000,000.00. Due consideration has been given to the fact that there has been and will probably continue to be a great increase in claims accruing from this scheme of old age pensions. The span of human life has been prolonged, and the census returns show that whereas in 1891 there were 5,200,000 between the ages of forty and sixty, in 1921 there were 9,700,000 between these ages. In fifty years' time it is calculated that the cost of old age pensions will be doubled. In thirty years' time there will be in Great Britain double the present number of old and feeble people, with an active population not very much larger than the present one. In consideration of these points, therefore, the Chancellor of the Exchequer has proposed to so allot the contributions of the employer and employed that the parliament of the future, say in thirty or forty years' time, would not be overburdened with obligations. In the scale he has proposed, the cost to the state from the tenth year will be \$75,000,000, from the fifteenth year \$100,000,000, and from the twentieth, \$120,000,000, after which there will be a decline, with the scheme ultimately becoming self-supporting.

The new burden to the state will be a heavy one, but Mr. Churchill has pointed out that it will be offset

by a constant diminution of war pensions, together with the paying-off of the American debt.

H. E. MACDERMOT

The continual respect and devotion displayed in connection with the name of William Harvey is illustrated in the following note (*Brit. Med. Jour.*, May 9, 1925):

William Harvey died in his eightieth year on June 3rd, 1657, and on June 26th his remains were deposited in a vault adjoining the parish church of Hempstead in Essex. He was "lapt in lead," and on his breast in great letters was his name, "Doctor William Harvey." By the middle of the last century this vault underneath the Harvey Chapel had become ruinous. On January 28th, 1882, the tower of the church fell towards the south-west; it is still a heap of stones in the churchyard. On October 18th, 1883, the body was removed from the vault and placed with all due reverence in a handsome white marble sarcophagus erected by the Royal College of Physicians of London in the chapel above the vault. With it was deposited a leaden case containing the edition of the works of Harvey published by the College in 1766, and a vellum memorial recording the circumstances of the removal. It is now proposed to restore the fallen church tower as a further memorial to William Harvey. The village of Hempstead lies in a sparsely populated agricultural district, seven miles from the railway station of Saffron Walden and some fifty from London, and an appeal for £5,000 is being made for the carrying out of the project. The clergy of the diocese and the Royal College of Physicians have given their support together with representatives of several other scientific societies and institutions.

We have received a preliminary notice regarding the *Post-Graduate Medical Journal*, to be published as the official organ of the Fellowship of Medicine, London. The first number will appear on September 1st. The aim of the publication is to be a medium by which the practitioner can be kept in touch with all the details of post-graduate teaching, including selections from the many lectures which are delivered to post-graduates under the auspices of the Fellowship of Medicine, in addition to other matter of clinical interest.

The *Journal* will be published at 6d. net monthly at No. 1 Bedford St., London, W.C. 2, the annual subscription being six shillings, post free. We hope in future issues to give further details regarding the continued development of post-graduate teaching in London.

## News Items

### GENERAL

#### ERNEST HAROLD BAYNES MEMORIAL

From Dr. W. W. Keen, of Philadelphia, we learn that a memorial fund is to be raised to commemorate the life of Ernest Harold Baynes, author, lecturer, poet, lover of birds and animals and of all mankind.

It was Mr. Baynes who started the society that saved the American bison from extinction; who started the first bird club sanctuary at Meriden, N.H., and organized nearly 300 bird clubs in the country; who went to Europe during the World War, and spent many months studying the part taken by animals in the Allied

armies in winning the war; and who perhaps more than anyone else interested people generally in animal life and the great outdoors. Loving animals, he investigated the sensational charges of the anti-vivisectionists, and finding them groundless, gave unstintingly of his time and energy, and made great financial sacrifices, in an effort to combat the anti-vivisection propaganda. Though knowing that death was near, he kept on with his work heroically to the very end.

A committee has been formed which proposes to raise a fund of \$100,000 as a memorial to Mr. Baynes; so much of the income as in the judgment of the committee may be necessary for the comfort of his widow, to be paid to her annually; the remainder, and at her death the principal, to go to the *American Association for Medical Progress*, that society which Mr. Baynes helped to organize for the dissemination of the truth concerning the value of scientific medicine, and in which he was most interested at the time of

his death. The fund is to be administered by the First National Bank of Boston as Trustee.

Dr. Keen writes that the committee desires to have the influence and assistance of the profession throughout America and asks every physician to contribute to it. The Editorial Office of this journal will be glad to acknowledge and forward any amount that any member of the profession in Canada feels inclined to give.

We have received a list of additional hospitals approved of by the Council on Medical Education and Hospitals, for the training of interns, in which one more Canadian hospital has been included.

The list of Canadian hospitals so approved was published in March last (*J.A.M.A.*, March 28th) as follows: The Montreal General Hospital, The Royal Victoria Hospital, The Toronto General Hospital, The Vancouver General Hospital, The Winnipeg General Hospital. To this list has been added the University of Alberta Hospital, Edmonton, Alta.

## NOVA SCOTIA

Dr. H. R. Corbett has resigned from the staff of the Nova Scotia Sanatorium and has accepted an appointment to the staff of the Irene Byron Sanatorium, Fort Wayne, Indiana.

Dr. N. P. Caldwell, Secretary of the Council of Medical Education, American Medical Association, was a recent visitor to Halifax. The purpose of his visit was to inspect the facilities for the teaching of medicine at Dalhousie University.

The Conference of Canadian Universities met at Halifax early in June, and was largely attended. Several medical schools were represented, the medical delegates being Dean Rankin, of the University of Alberta; Prof. D. A. L. Graham, of the University of Toronto; Professors R. F. Ruttan and A. B. Macallum, of McGill University; Dean Harwood, of the University of Montreal; and Doctors K. A. MacKenzie, A. G. Nicholls and W. H. Hattie, of Dalhousie University. Dr. J. W. Smith, Liverpool; Dr. G. W. Whitman, Stellarton; Dr. M. E. McGarry, Margaree.

Candidates are being nominated in the various counties for the provincial election which is to take place June 25th. Among those already nominated we note the names of Doctors J. G. MacDougall, Halifax; J. W. Reid, Windsor; W. N. Rehfuess, Bridgewater; B. A. LeBlanc and G. R. Devcan, Arichat; John MacDonald, St. Peters; J. L. MacIsaac, Antigonish; N. J. Wardhope, Springhill; Daniel MacDonald, North Sydney.

The first annual meeting of the recently organized Western Counties branch of the Medical Society of Nova Scotia was held at Yarmouth on the 26th of May. The attendance was large and much interest

was manifested. Among those who contributed papers were Doctors Jones, Ohler and Dewis, of Boston; and Dr. Murphy, of Halifax. The officers appointed at the organization meeting were elected for the ensuing year.

The new St. Mary's Hospital, at Inverness, was dedicated and formally on the 25th of May. Dr. Proudfoot, the Mayor of the town, acted as chairman of the proceedings. Bishop Morrison, assisted by several clergymen, dedicated the building. Addresses were given by Dr. H. A. Chisholm (representing the Provincial Department of Health), Dr. Daniel MacDonald, of North Sydney, Dr. M. T. Sullivan, of Glace Bay, Dr. M. R. McGarry, of Margaree, and others. The new building is well planned and equipped, and will be a great benefit to the people of Inverness and the surrounding country.

The seventy-second annual meeting of the Medical Society of Nova Scotia is to be held at Bridgewater, under the presidency of Dr. W. N. Rehfuess, on the first and second of July. The Association of Medical Health Officers meets on the last day of June, and a public meeting has been arranged jointly by the two organizations for the evening of that day, at which addresses will be given by Dr. Wodehouse, of Ottawa, and Dr. Gordon Bates, of Toronto. For the meeting of the Medical Society a very attractive programme has been arranged. Speakers from without the province include Dr. Harris MacPhedran and H. B. Van Wyck, of Toronto.

Dr. Abraham Medjuck, a graduate of Dalhousie, 1923, has passed the New York State Board medical examinations and has established his practice in New York City.

W. H. HATTIE

## QUEBEC

Dr. W. L. Ritchie, late roentgenologist with the Ottawa Civic Hospital, has recently joined the staff of The Montreal General Hospital, as director of the radiology department. Doctor Ritchie succeeded Dr. Walter Wilkins as director of this department, Dr.

Wilkins having resigned to devote all his time to private practice. Dr. Ritchie is a graduate of the Toronto University, having graduated in 1910. He spent ten years in general practice in British Columbia, following this he specialized in x-ray work, and went



to New York, where he worked as assistant to Dr. Louis Gregory Cole. After this he returned to Toronto, and for a year he worked in the Radiology Department of the Toronto General Hospital with Dr. Richards and Dr. Dickson.

His next step was to go to Ottawa where he was in charge of the Radiology Department in the Protestant General Hospital, and St. Luke's Hospital.

At the Montreal General Hospital on the afternoon of the 27th of May there were unveiled, in the presence of a large company, memorial tablets to three distinguished men, namely, Sir William Osler, Dr. Wyatt Johnston, and Dr. John McCrae. After introductory remarks by the President of the Hospital, Colonel Herbert Molson, the service of dedication was read by the Very Reverend Arthur Carlisle, Dean of Montreal. Then followed brief addresses by Dr. Shepherd, Dr. Ruttan, and Dr. Martin, Dean of the Faculty of Medicine.

Dr. Shepherd dwelt upon Sir William Osler's intimate connection with the hospital during a period of ten or twelve years, first as a student, then as the first pathologist, and lastly as attending physician, having been elected directly to the indoor service, without going through the probationary course as physician to the outdoor department. Dr. Shepherd pointed out that the materials for the first edition of Osler's great work on *The Principles and Practice of Medicine* (which has gone through so many editions and been translated into so many languages, even Chinese) were chiefly obtained in the wards and post mortem room of the General Hospital. Dr. Shepherd also pointed out that Sir William Osler influenced every one with whom he came in contact, especially the younger men, and did much to advance the cause of medical education on this continent. He established the method of bedside teaching in the hospitals of the United States, a method which he had learned first from the late Dr. Palmer Howard in the wards of the General Hospital. Sir William had been a marvellous and sympathetic teacher and had the faculty of inspiring the love and admiration of all who worked with him. Although he was always making new friends, he never forgot the old ones, especially those friendships made in his earlier years. He made friends of his hospital patients and treated them as human beings and not as mere cases. In conclusion Dr. Shepherd said: "It is a splendid tradition that so great a man and so great a physician once lived with us and shared and influenced our activities, and set an example of humanity, conduct, work, and investigation, which all his successors would do well to follow."

Dr. Ruttan spoke feelingly of his long and intimate association with Dr. Wyatt Johnston, who possessed an intimate knowledge of both human and animal morbid anatomy and was the first to carry out bacteriological investigations at the General Hospital. To the solution of pathological problems he brought a fertile and original mind, which suggested many new lines of research. He early attracted attention and soon won wide recognition on both continents by the originality displayed in his published papers on pathological and medico-legal subjects. His colleagues owed much to his untiring industry and stimulating personality.

Memories of John McCrae, physician, poet, soldier, were awakened by the stirring remarks of Dr. Martin. He felt that it was peculiarly fitting that the name of John McCrae should be linked with those of Osler and Johnston, combining as he did the facile pen and literary taste of Osler with the scientific spirit of investigation characteristic of Johnston. John McCrae was for several years pathologist to the General Hospital and edited Volume IV. of the *Pathological Reports*. As a physician and teacher he was respected and admired for his great knowledge of pathology

and clinical medicine; as a poet his name is immortalized in the most widely known of all war poems "In Flanders' Fields"; as a soldier he served with distinction in the South African War as a major of artillery, and in the Great War he was M.O. to the First Brigade of Artillery, First Canadian Division, later Lieut.-Colonel in charge of Medicine No. 3, Canadian General Hospital (McGill). He had just been appointed Consulting Physician to the First Army when he fell a victim to pneumonia, induced by overwork and hardship in France. His career was one of distinction; an irreparable loss has been sustained by that circle of intimate friends that gathered around him, enjoying his genial companionship and receiving his inspiration.

Dr. I. M. Rabinowitch, Director of the Department of Metabolism at the Montreal General Hospital, and Dr. E. H. Mason, assistant physician at the Royal Victoria Hospital, have been appointed assistant professors in the Faculty of Medicine of McGill University.

The Roddick Memorial Gates, erected by Lady Roddick at the main entrance on Sherbrooke Street to McGill University in memory of her husband, the late Sir Thomas George Roddick, one time Dean of the Medical Faculty of the University, were formerly opened on May 28th. Lady Roddick unlocked with a gold key the golden padlock of the gates and was the first to enter. The procession proceeded up the main avenue to the Arts Building where platforms had been erected for the dedicatory service. Dr. C. F. Martin, Dean of the Medical Faculty gave the address and paid a fitting tribute to Sir Thomas Roddick.

The American Public Health Association met in Montreal as the guests of the University of Montreal. At the dinner at the Mount Royal Hotel the chair was taken by the Honourable Athanase David who proposed a toast to our guests and welcomed on behalf of the Quebec Government the members of the Association. It was good, he said, for men to try to know one another and scientists of different countries can gain by inter-association. No wall can stop intercommunication between two friendly peoples; the wall is political only. Let our friendship disregard the wall and advance the welfare of the public and the cementing of international good-will.

The annual meeting of the Canadian Tuberculosis Association was opened in the Mount Royal Hotel, Montreal on May 14th. More than one hundred medical men from a distance, nurses and public health workers registered. During the forenoon of the first day the majority of the delegates attended a clinic at the Royal Victoria Hospital at which Dr. Edward Archibald addressed them on the subject of surgery in tuberculosis. At noon the delegates were entertained at luncheon by the Sun Life Assurance Co. At the general meeting in the afternoon the papers read on the various aspects of tuberculosis were of a high class. Many of them will appear in the August number of the *Journal*. Dr. A. Rousseau, Dean of the Laval University in Quebec was elected President of the Canadian Tuberculosis Association for the next two years.

The Montreal Unit of the Shriners' Hospital was opened with much ceremony on May 10th. This institution is for the surgical treatment of fifty children suffering from deformities which can be relieved. It is situated next to the Children's Memorial Hospital on Cedar Avenue, which hospital already cares for about one hundred crippled children suffering from similar conditions. It is, therefore, to be hoped that the Shriners will confine their efforts to the treatment of those whose residences are outside of Montreal, as otherwise there will be a duplication of effort.

We are told that the Shriners' Hospital is to be supported wholly and entirely by the Order of the Mystic Shrine. If this be true we laud such effort to relieve suffering humanity as a visible sign of a new era in the work of a fraternal organization.

Dr. A. D. Blackader and Dr. A. T. Bazin, of Montreal, and Dr. T. C. Routley, of Toronto, will be present at the opening ceremony of the new home of the British Medical Association which is located at Tavistock Square, London. They will also attend the annual meeting of the British Medical Association which is being held at Bath.

The Provincial Government instead of making such alterations in the old court house at St. Scholastique as would transform it into a hospital for the criminal insane, have now under consideration the completion of the two unfinished wings of the provincial jail at Bordeaux for the accommodation of some 400 criminal insane. At the last Session Premier Taschereau and the Hon. Athanase David introduced special legislation regarding the handling of this class of individuals. At present the insane criminals are either locked up in common jails where they are given special quarters or placed in ordinary insane asylums

under special care. There has been, however, much objection raised by relatives of the non-criminal class to the fact that by this plan criminals were to some extent in contact with ordinary patients. There are in the various asylums in this province some 300 criminal insane. At the Asylum of St. Jean de Dieu there are at present nineteen murderers.

Ste. Agathe Sanatorium is to be re-opened shortly for the care of the Protestant section of the community suffering from tuberculosis. Under the name of "The Laurentian Sanatorium Company" incorporation was granted this week to a group of Montreal men who have in the past taken an active part in the fight against tuberculosis. As soon as letters patent have been granted the Sanatorium property will be altered to render it in every way suitable for its object. It is expected that the appointment of the superintendent will be announced shortly. This sanatorium will accommodate several hundred patients. It is expected that quite a number of beds will be available during the course of the present summer. For the Catholic portion of the community a large sanatorium is being built in the neighbourhood of Montreal and it is hoped that this will also be ready for patients by the end of the season. GEO. HALL

## ONTARIO

### NEW GOVERNORS OF UNIVERSITY OF TORONTO

Premier Ferguson, as Minister of Education for Ontario, announced the following appointments to the Board of Governors of the University of Toronto to represent the Alumni Federation:

Harry Bertram Anderson, M.D.; Angus MacMurehy, K.C.; Rt. Hon. Lyman Duff and J. J. Gibson.

F. Gordon Osler has been appointed a governor in the place of his father, the late Sir Edmund Osler, and Dr. F. W. Merchant, Superintendent of Education for Ontario, is an added member, appointment dating from June 20th.

Reappointments are Dr. D. Bruce MacDonald, T. A. Russell, Canon Cody, Vincent Massey, Sir Joseph Flavelle, Hon. H. T. Kelly, R. W. Leonard, R. A. Pyne, W. K. George, Eric Armour and Hon. N. W. Rowell.

Five governors whose terms have not expired yet are Col. A. E. Gooderham, Daniel Miller, Sir John Willison, W. C. Good, M.P., and J. A. Wallis, and in addition are the two ex-officio members of the board, Chancellor Sir William Mulock and President Sir Robert Falconer.

### OFFICERS FOR THE HARVEY CLUB FOR 1925-1926

Hon.-Pres., Dr. V. E. Bateson; Pres., Dr. H. W. Hill; Vice-Pres., Dr. J. W. Crane; Sec., Dr. F. W. Luney; Treas., Dr. S. M. Fisher; Editorial Staff of *H. C. Bulletin* for three years, Dr. G. W. A. Aitken; Auditors, Drs. J. I. Ferguson and A. J. Grant; Flower and Sick Committee, Drs. Bateson and J. E. Lindsay.

At a meeting of the Porcupine District Medical Society at Timmins, on April 18th, Dr. E. A. Morgan, of Toronto, gave a talk on "Common errors in the diagnosis of acute conditions in children."

The Welland County Medical Society met at Welland on April 21st, when Dr. Harold Kinsey gave an address

on "The differential diagnosis of chest diseases."

On April 22nd, at a meeting of the Oxford County Medical Society at Woodstock, Dr. Geo. E. Wilson, of Toronto, gave a talk on "Fractures."

The North Waterloo Medical Society met at Kitchener on April 24th. Dr. F. W. Hughes, of London, gave an address on "Medical men in literature."

At a meeting of the South Waterloo Medical Society held at Preston on April 24th, Dr. Goldwin Howland, of Toronto, spoke on "Normal individuals and their pathological trends."

The Grey County Medical Society met at Markdale on April 24th; the following addresses were given:—"The diagnosis and treatment of the common skin affections," by Dr. D. King Smith, and "Tuberculosis in childhood," by Dr. H. C. Parsons.

On May 1st, Dr. A. J. MacKenzie, of Toronto, addressed the Victoria County Medical Society at the Ross Memorial Hospital, Lindsay, his subject being, "Per-nicious and grave anemias."

At a meeting of the Hastings County Medical Society held at Belleville on May 13th, Dr. Harold Kinsey gave a talk on "The differential diagnosis of chest conditions."

The Brant County Medical Society met at Brantford on May 14th; Dr. W. E. Gallie gave an address on "Orthopaedic surgery."

Dr. W. L. Robinson addressed the Barrie District Medical Society at Barrie on May 14th, his subject being "Classification, pathology, diagnosis and treatment of new growths."

**MANITOBA****ANNUAL REPORT OF WINNIPEG GENERAL HOSPITAL**

The 52nd Annual Report of the Winnipeg General Hospital, which has just been received, briefly summarizes the activities of the institution for the year 1924. Some of the figures are particularly worthy of note as indicating the very large volume of hospital service that is being rendered.

Twenty-one thousand patients were treated during the year—over 12,000 of these were admitted to the wards—the remainder were cared for in the Out-Patients' Department. Almost 200,000 days' hospital treatment were given.

It is interesting to note comparative figures for the last twenty years. The average period of time in hospital per patient has been reduced from nineteen to fifteen days—the mortality has been cut in two.

Continuing the policy of creating new appointments

on the honorary attending staff when the work justified it, a number of additional appointments were made during the year.

Economically the trend of the hospital's service has been a reflection of the community's condition. The ratio of private and semi-private patients to public patients has practically reversed in the last four years—now the demand is much heavier for the public wards than for the pay wards.

The increase of from 50 to 100 per cent. in blood chemistry and basal metabolism and the increase of 80 per cent. in autopsies performed indicate that the scientific investigation of disease is more thoroughly undertaken.

The School of Nursing graduates this year ninety-five students, the largest number in the history of the school.

The total cost of maintenance for the year was \$718,000.00.

**ALBERTA**

The annual meeting of the Alberta Medical Association will be held in Calgary in September.

Dr. J. H. Birch, of Calgary, is now in Budapest, Hungary, devoting himself to special work in ophthalmology.

Dr C. E. Coleman has returned to Calgary, having spent the past seven months in post-graduate studies in New York.

Alberta University conferred for the first time the degrees of M.D., C.M., at the Annual Convocation, which took place at Edmonton on May 15th. There were eleven candidates. The Mosher Memorial medal in medicine was awarded to Miss L. C. McGregor.

Reference was made in last month's items to a proposed bill respecting private hospitals. This bill has now been passed by the Provincial Legislature. One of the chief aims of this legislation, is to correct certain abuses, which have been prevalent in several privately run institutions. Hence provision is made for the licensing of private hospitals, which now must have

a resident superintendent. A register must be kept, and the hospital must be open to inspection. Operations are not permitted in places where accommodation can be obtained in approved hospitals, unless and until, the consent of the Department of Public Health has been obtained. An approved hospital is one that is approved by the Minister of Public Health, but this approval does not imply that it becomes a public hospital and receives grant. The Act comes into effect on July 1, 1925. Severe penalties are provided for any violation of the Act. Under Clause 12 we read that:

(1) "No operation shall be performed in a private hospital, in any place where accommodation can be obtained in an approved hospital, unless and until, the consent of the Department of Public Health has been applied for and obtained, excepting operations of an ordinary obstetrical nature."

(2) "Curettage or Caesarean section shall not be considered to be of an ordinary obstetrical nature."

(3) "If the consent as aforesaid is applied for and obtained all the provisions respecting operations contained in the regulations under the Hospitals Act shall be observed."

This Act should tend to check the type of operation at which it is largely aimed.

**BRITISH COLUMBIA**

Dr. Wm. T. Kergin, of Prince Rupert, recently left on a trip to Europe. He expects to return about August 1st.

Owing to the closing down of the mill at Buckley Bay, Dr. G. F. Palmer has relinquished his practice at that place. He is at present enjoying a holiday in Vancouver.

Dr. A. A. King, of Ladner, is leaving on June 15th for three months post-operative work in eastern cities. His practice will be cared for by Dr. H. C. McKenzie.

At the annual meeting of the British Columbia Medical Association to be held on July 3rd there will be a dinner at which an address will be given by Sir Henry

Gray, Surgeon-in-Chief of the Royal Victoria Hospital, Montreal. It is expected that quite a number of out of town doctors will be present on that occasion.

An interesting wedding took place in Victoria on June 1st, when Dorothea, third daughter of the late Sir Richard and Lady McBride, became the bride of Dr. J. H. Moore, Southgate Street, Victoria. Dr. Moore is the genial and indefatigable Hon. Secretary-Treasurer of the Victoria Medical Society and it is interesting to note that conspicuous among a number of very beautiful presents was an engraved silver tray and silver tea and coffee service, the gift of the Victoria Medical Society.

Dr. W. A. Dobson, of Vancouver, on May 11th, gave an address before the Victoria Medical Society on the

subject of "The Treatment of the Neuroses." There was an excellent attendance of medical men and the consensus of opinion was that it was one of the best talks the Society had had for some time. The address was given under the auspices of the British Columbia Medical Association.

Dr. G. A. Lamont, of Vancouver, will be the speaker at the Victoria Medical Society's meeting to be held on June 6th. He will speak on "Baby Problems."

Quite a number of the Victoria profession are proposing to attend the Annual Meeting of the Canadian Medical Association at Regina this month, and they will take with them a very cordial invitation for that organization to hold its 1926 meeting in Victoria. In the event of its acceptance, no effort will be spared to ensure a successful and pleasurable time. The scenic beauties surrounding Victoria are well known, whilst its golf courses, ideal motor roads and other phases of amusements, etc., are unsurpassed.

The annual meeting of the No. 4 District Medical Society, (Okanagan Branch of the British Columbia Medical Association) will be held at Merritt, B.C., about the middle of September. Practically every member of the Society has already signified his intention of being present and there is every prospect of a record attendance.

The activities of the British Columbia Medical Association continue to give considerable satisfaction to its members. Its business office, always at the service of members, has been made much use of during the past few months. A heavy daily mail and numerous personal visits from out-of-town doctors keep the staff fully occupied.

The annual visit of the Executive Secretary to places along the coast, Vancouver to Anyox, resulted in his securing a 100 per cent. paid-up membership and stimulating a keen interest on the part of every doctor in the work of the Association.

Owing to the closing down of the saw mill at Swanson Bay, Dr. M. Fox has left that place, and is at present enjoying a holiday at Winnipeg.

The largest class of nurses to graduate from the training school of the Vancouver General Hospital, received their diplomas on May 29th. Eighty-eight graduated from the training school, and in addition four ladies received the degrees of B.Sc. (Nursing) from the University of British Columbia.

We are very sorry to report that Dr. Allison Cumming is still confined to his house through illness and it will be some time yet before he is able to resume practice. He recently paid a visit to the Mayo Clinic accompanied by Dr. J. W. Thomson.

The Pacific Coast Oto-Ophthalmological Society meeting—June 18th, 19th and 20th, is expected to be a record one. Already a large number of men from south of the Line have signified their intention of being present. Dr. H. M. Cunningham, of Vancouver, is the president this year. Among the speakers are: Dr. Gordon B. New, Dr. H. V. Wurdemann, Dr. G. Piness, Dr. Chase, Dr. Edward Jackson (of Denver), Dr. L. Klempner, Dr. M. J. Keys and others.

Dr. H. A. Spohn and Dr. R. E. Coleman, of Vancouver, will give a paper on "Some Metabolic Observations in Herter's Disease" before the North West Pacific Paediatric Association at Portland, Ore., on June 29th.

## UNITED STATES

We have received Venereal Disease Bulletin No. 77 from the U.S. Public Health Service, reporting the transactions of a conference of venereal disease control officers of the State Health Departments, held in December, 1924. A special committee reported a resolution herewith given in part:

"Whereas organized efforts in combating the venereal diseases in the United States during the past ten years have progressed steadily toward a practical programme which has secured public support (and) that experience has shown that medical treatment can

be further supplemented in reducing the prevalence of these diseases, (and) that education and measures for the control of environment can be aided by the incorporation of measures for immediate disinfection of those exposed to these diseases, ... Be it resolved that greater efforts now be made by official and voluntary agencies to devise and demonstrate community procedures to this end."

This resolution was adopted by the conference after full and free discussion.

**Glass Permeable to the Ultraviolet Rays.**—Lecturing at the Royal Institution on "The Biological Action of Light," Mr. Leonard Hill produced three types of glass which are permeable to the ultraviolet rays, now known to be so valuable in the prevention of disease. Since one of these is low priced, it may be possible for even the poorest hospital to use it. It is necessary to have this glass only in the upper parts of the window, but care has to be taken to keep it very clean, as the smoke-

polluted air of our cities quickly clogs up the glass, which then cuts off the ultraviolet rays. This glass is being tested in a London hospital. Mr. Hill hopes that some windows in every ward of our hospitals, nurseries and schools will be so glazed that advantage may be taken of every ray of sunlight that can struggle through our fog and smoke laden atmosphere. —Letter from London, *Jour. Am. Med. Ass.*, April 25, p. 1284.



## Book Reviews

**Manual of Medicine.** By Thomas Kirkpatrick Monro, M.A., M.D. Fifth edition. 1033 pages with charts. Price 25s net. Bailliere, Tindall & Cox, Covent Garden, London, 1925.

A "manual" is defined as a book "such as may be carried in the hand, or be conveniently handled," a definition with which manuals of medicine cannot now be easily made to conform. The extent to which material must be compressed renders such works peculiarly liable to criticism, and Dr. Monro is to be congratulated on the skill with which he has steered between the Scylla of condensation and the Charybdis of unwieldiness. The manual was originally written (1903) because he felt that there was a need of something to fill the gap in medical reference books, particularly for students and junior practitioners, and there has been constant revision (this is the fifth edition) with this need in view. It may be questioned whether the value of the book is as great for the student as the practitioner; at any rate the former would have to considerably amplify his reading from other sources. On the whole, however, it can be recommended as compact and well-written. There have been elisions of obsolete methods in urinalysis, and the increasingly important subject of the sugar content of the blood has been more fully dealt with. The section on diseases of the skin (as in previous editions) is full and well chosen and should prove useful to the general practitioner in a large proportion of the skin conditions met with in the daily routine of ordinary practice. E. H. MACDERMOT

**Practical Lectures.** The Medical Society of the County of Kings, Brooklyn, New York. (1923-1924 series). Various authors. One hundred and thirty-two illustrations and three coloured plates. Paul B. Hoeber Inc., New York, 1925.

This volume consists of a series of practical lectures given under the auspices of the Medical Society of King's County, Brooklyn. They were intended as a type of post-graduate course and the subjects and also the lectures were chosen with a view to making the meetings as useful as possible to the general practitioner.

The various topics are covered in a very informal way, but make interesting reading. Chief among the medical subjects are the treatment of pneumonia of Harlow Brooks, subacute bacterial endocarditis by Libman, renal function by Mosenthal, and chronic diseases of the joints by Thomas McCrae, while of surgical interest are papers by Joseph Blake, Jennings, McCausland and Fowler. Gynaecology and obstetrics are represented by three excellent papers by Polak and one by Dickenson. In all there are twenty-five articles.

The large attendance at these lectures testified to the appreciation of the profession, and taken as a whole the papers well repay a careful perusal.

D. S. LEWIS

**"The Chemical Aspects of Immunity."** By H. Gideon Wells, 1925, 245 pages. Price \$5.00. Monograph Series American Chemical Society. The Chemical Catalogue Co., N.Y.

In his new book Dr. Wells has attacked the problem of immunity from the chemical standpoint, attempting to coordinate the known facts with our present knowledge of colloidal chemistry. It is a difficult subject, but the argument is most suggestive and leads toward a clearer understanding of the general biological phenomena involved. The book

should be of especial interest to students of this problem of fundamental importance.

Ever since the early observations of Bordet that there was much in common between the reactions of immunity and those of colloidal chemistry various investigators have been adding knowledge, culminating in the more recent contributions of Jacques Loeb on the behaviour of protein solutions.

The volume covers the subject thoroughly, devoting separate chapters to "Antigens," "Immunological Specificity," "Nature of the Antibodies," "Neutralization of the Toxin by Antitoxin," "Agglutination and Precipitation Reactions," "The Lytic Reactions," with a discussion of the chemical aspect of the Wassermann reaction, and a chapter on "Hypersensitiveness, Anaphylaxis, and Allergy."

The author is a leader in a new line of thought, and is generous with his suggestions for productive research. The book should attract great interest and stimulate discussion.

E. H. MASON

**A Compend of Gynaecology.** William Hughes Wells, M.D. Fifth edition revised and enlarged. 371 pages, 167 illustrations. Price \$2.00. P. Blakiston's Son & Co., Philadelphia, 1925.

This little book, as it states, a compendium, and makes no more ambitious pretensions. Like all works on gynaecology, it falls into two divisions, non-operative and operative.

The non-operative section is, on the whole, admirable: the pathology, symptoms, diagnoses and treatments are given clearly and very concisely. Occasionally, but not often, clarity is sacrificed to brevity, to some degree. Some of the treatments seem old-fashioned, but they may be none the worse for that. The newer treatments are also given. This part of the book is excellent for the student in reviewing, and for the man in practice, who wishes to quickly refresh his memory on certain points.

The operative section does not make the same appeal, mainly on account of its brevity. If a surgeon or would-be surgeon has occasion to do a certain operation, he either knows how to do it, or he does not know how. If he knows, he doesn't need any description of the operation; if he does not know, he needs a full description. Hence this book, with its descriptions pared as closely as possible, is of no material benefit to either class. Even if an intending operator knows all about his proposed operation except one or two minor points, it is extremely probable that these would turn out to be among those left out in the interests of brevity. To the reviewing student, however, this part of the book also will prove quite useful.

P. M. CAMPBELL

**Essentials of Immunology for Medical Students.**

Arthur F. Coca, M.D. 194 pages, with illustrations and charts. Price \$3.50. Williams & Wilkins Co., Baltimore, 1925.

Dr. Coca looks forward to the gradual substitution in medicine of scientifically founded principles for the "empiricism" on which we still largely depend. Leaving aside any reflections that might be made on the use of the term "empiricism" as being altogether the converse in medicine of "scientific principles," one must admit the necessity for such a book as this in the list of students' manuals. The difficulty of the subject cannot be used as an excuse for too rigidly confining it within the limits of a specialty. The general practitioner will rightly defer his complete assimilation of the long and growing list of new terms

which immunology brings forth with such prodigality, but he cannot allow himself to be ignorant of the Schick test, the Dick test, the detection of sensitiveness by cutaneous tests, the methods and dangers of desensitization, the terrible potentialities of anaphylactic shock.

Dr. Coca has tried to make a selection of certain technical and theoretical details of immunology, which shall serve not only as a useful framework of knowledge, but also as a stimulus to the further pursuit of a subject which holds such fascinating problems. No one is better suited than he for the task of winnowing out the clearly understood points from the mass of theory and insidiously distracting speculative elements in this abstruse subject.

H. E. MACDERMOT

**Immunity in Natural Infectious Diseases.** By F. d'Herelle, Director of the Laboratory of the International Sanitary Council, at Alexandria, Egypt. Authorized English edition by George H. Smith, Ph.D., Associate Professor of Bacteriology and Immunology at Yale University School of Medicine. 400 pages. Price \$5.00. Published by Williams and Wilkins Company, Baltimore, 1924. (See Editorial "Theories and Hypotheses in Immunology").

**Matthes' Differential Diagnosis of Internal Medicine.** By M. Matthes, M.D., Professor of Medicine and Director of the Medical Clinic, University of Königsberg.

This is the authorized translation by I. W. Held and M. H. Gross, of New York, of the fourth German edition. The translators have made extensive additions on certain subjects to include the English and American methods of differential diagnosis. The material is divided into twenty-four chapters which deal with acute and chronic infectious diseases of the peritoneum, the respiratory tract, the cardio-vascular and renal systems, the gastro-intestinal tract, chronic bone and joint diseases, some forms of neuralgia, and the differential diagnosis of some diseases of metabolism and the endocrine glands. The latter chapter is rather short and makes no reference to diseases of the pituitary gland, this being dealt with under the heading of diabetes.

The plan of emphasizing the subjective and objective symptoms of the particular disease in question, followed by a consideration of the differentiation of it from every other condition which may be confused with the disease under consideration is followed. The book is profusely illustrated with diagrams and cuts. There is a very good series of x-ray plates dealing with various stomach conditions. In the chapter dealing with diagnosis of diseases of the liver and biliary ducts, reference is made to the Van den Bergh and Rosenthal functional tests. The former investigator, he points out, has made an important finding by showing that the bilirubin of hematogenous origin gives a different reaction from that excreted by the liver cells and reabsorbed. For differential diagnosis of diseases in the urinary organs, considerable space is given to the various tests of kidney function which include MacLean's "urea concentration factor." A complete page is taken up with a diagrammatic scheme for differential diagnosis of paralytic ileus and mechanical ileus.

The discussion on the various types of asthma is clearly stated and considerable space is given to the rôle which proteins play in the etiology of asthma, and a list of the more common offending ones is recorded. The author's introduction to the differential diagnosis of the circulatory diseases is well worth reading. He emphasizes the lessons that were learned during the late war which emphatically demonstrated that the entire constitution is of unusual significance in the functional capacity of the circulatory organs.

The book, as a whole, is admirably suited for student, internist and general practitioner. The index is very complete and well arranged.

L. C. MONTGOMERY

**Reports of the St. Andrews Institute for Clinical Research, St. Andrews, Fife.** Vol. ii, 1924, 185 pages. Humphrey Milford, Oxford University Press.

This second volume containing contributions from the staff of the St. Andrews Institute is of very great interest from a physiological point of view. It is refreshing to see the early manifestations of disease made the problem of investigation.

Through the application of the principle of the reflex to the study of cardiac irregularities Sir James Mackenzie has thrown light on the exact location of the cardiac lesion. In a paper on "Cellular and Organic Activity," the same author has elucidated the "effects of the inter-play between impulse and cell," an attempt to clarify the big void in the study of medicine, that is, the nature of the so-called "vital force" which controls organic activity.

Prof. Herring's papers on "The Regulating and Reflex Process" and "The Alternating Periods of Activity and Rest in Living Tissue" are of fundamental importance. Partly through the work of Krogh on the capillaries we are comprehending the vast functional reserve of organs.

"The Sensory Activities of the Skin for Touch and Temperature" by Prof. Waterston introduces a new "conception of how impulses are conducted through the skin."

In addition to the above there are several other communications of importance. The volume is well illustrated and carefully edited. It should be a volume of interest to all physicians and depicts clearly the type of work being undertaken at St. Andrews Institute.

E. H. MASON

**A Text-Book of Histology.** By Harvey Ernest Jordan, A.M., Ph.D., Professor of Histology and Embryology, University of Virginia. Third edition (1924). 857 pages, 594 illustrations and 4 plates. Price \$6.00. D. Appleton and Company, New York and London.

In its latest issue (1924) Professor Jordan's histology shows evidence of retouching. One notes advance in such treatises as that on the microscopic anatomy of contracting muscle, which has been brought up to date in accordance with the author's views. A number of illustrations have been replaced by better ones, and there is still room for improvement in this regard, though there are very many clear and valuable figures.

There are occasional statements which are open to question, as, for instance, that on page 236 where, in discussing lymph nodes, it is said that the lymph is permitted to "percolate through the lymph nodules of the cortex before it can reach the looser portions of the medulla"—an idea which is repeated on page 238. Again, in describing the blood supply of the liver (p. 417) the statement is made that the blood carried by the hepatic artery "is of minor importance and is destined only for the nutrition of the connective tissue framework of the organ," whereas thirteen years ago Barcroft and Shore (*Jour. of Physiol.*, Vol. 45, p. 306) concluded from their evidence that "The hepatic artery is the dominating source of oxygen supply to the liver."

The book is of convenient size and neat appearance, and is to be recommended to students and practitioners. There are some good technical directions, and also a laboratory guide for a course in microscopic anatomy.

C. C. MACKLIN

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*Prospectus sent on request*

**Medical and Surgical Report of the Roosevelt Hospital.** New York. Second series, 1925, based on the work of the years 1915-24 inclusive. 378 pages, 47 illustrations. Price \$5.00. Paul B. Hoeber, Inc., New York, 1925.

Some of the most interesting and useful contributions to medical literature have come from hospitals and clinics where the workers were in close touch with the living, human flesh, and therefore had neither time nor opportunity for new theories. This volume comes from a great workshop, a large metropolitan hospital, and is a record very largely of bedside and operating-room observations, and is therefore very valuable to the practising physician. The staff of the Roosevelt believes that one important function of a hospital is to try out various methods of treatment and then to select and report the best. This, to a large extent, is what is contained between the covers of this report.

There are in all, thirty-four articles, mostly surgical. For the most part they deal with some rare conditions, such as esthiomene, or tuberculosis of the spleen; or they strive to state succinctly our present knowledge on questions that have more recently come into medicine, such as the classification of Bright's disease, and the relation of non-protein nitrogen and blood pressure to kidney and heart lesions.

One of the most interesting contributions compiles the end-results in 201 cases of carcinoma of the cervix, and shows a marked improvement in the mortality where radium has been combined with surgery. Other articles worth noting are: acute suppurative pleurisy, echinococcus disease of the kidney and pyelitis in infancy.

F. A. CLARKSON

**The Physiology of Mind.** By Francis X. Dercum, A.M., M.D., Ph.D., second edition. 12mo. of 287 pages. Price \$4.00 net. W. B. Saunders Co., Philadelphia and London: The J. F. Hartz Co. Ltd., Toronto and Montreal, 1925.

This work of Dercum's is extremely interesting, inasmuch as he attempts to relate the physiological and pathological mental changes occurring in nervous and mental cases to biological, morphological, physical, and chemical causes.

His principal chapters follow the plan of giving succinct accounts of the biological and morphological states in animal life of lower types, with such physical and chemical changes as are known, and to gradually pass from these lower forms to the higher mental organizations. The former part of the book is interesting and instructive, but when he attempts to relate the mental changes to the effect of physical and chemical changes, the reasoning is not so easy to follow.

He has apparently a theory, making thought processes and consciousness entirely mechanical, physical, and chemical, and the argument appears to be excellent at the commencement, but the gap between the reflex and the voluntary appears to require more adequate filling in by science, before the correlation of his ideas are sufficient to satisfy the observer.

G. W. HOWLAND

**Dynamic Psychology.** By Dom Thomas Verner Moore, Ph.D., M.D. 444 pages illustrated. Price \$3.00. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1924.

A book of great interest, written from a full experience, and giving one more to think of in this particular subject, than any recent volume. The practical view taken by the author of mental processes, and his explanations afford the reader considerable interest.

The articles on instinct, impulse and the expression of the emotions are particularly good and efficiently thought out, though probably all will not agree with his conceptions of desire and instinct.

Unfortunately he has attempted to add more definitions and terms to this overlaid subject, and this to a great extent lowers the value of the book as a text-book, as the "parataxes" as he terms them do not commend themselves to the reader. There is a slight over-valuation of the religious side, but it is well worked in.

The book as it stands is a valuable addition to the information relating practical psychology to psychological medicine, and will interest any person seeking to correlate the two.

G. W. HOWLAND

**The Surgical Clinics of North America.** Vol. v, No. 1 (New York Number—February, 1925). 294 pages, 142 illustrations. Per clinic year, February to December, 1925, paper \$12.00; cloth \$16.00 net. Philadelphia and London, W. B. Saunders Co. The J. F. Hartz Co. Ltd., Toronto and Montreal.

To make a satisfactory review of this volume, which contains so many varied subjects by so many different contributors, is rather difficult except in a general way.

The volume contains papers and case reports of exceptional value from a surgical standpoint, from New York clinics. It deals with a varied range of important subjects in a clear and concise manner, with well chosen and descriptive illustrations. The pathology, treatment, and end results have been as a rule very thoroughly described, while the detailed symptoms and differential diagnosis have purposely, for brevity, been avoided.

The more common diseases such as exophthalmic goitre, gastric and duodenal ulcer, urinary calculi, with their pathology, and each clinic's procedure in treatment are instructively taken up. The description of some very ingenious methods of overcoming surgical difficulties is refreshing. Two clinics are worthy of special mention for their heroic methods of treatment. First, splenectomy for purpura hæmorrhagica. Second, cervical sympathectomy for angina pectoris.

A brief description is given of the "Icterus Index," which opens up a field of research which may be of great value in the near future.

The variety of papers, different opinions and methods of treatment, as well as results obtained by different surgeons, make this a very desirable volume.

W. A. HARVIE

**The Bacteriology of Food.** By Cuthbert Dukes, M.D., M.Sc., D.P.H. 180 pages, 25 illustrations. Price 7/6d. net. The H. K. Lewis & Co. Ltd., 28 Gower Place, London, 1925.

Those engaged in the study and teaching of bacteriology will find this a very useful little book. As the author intimates it is perhaps most valuable for students of science studying bacteriology as one of the final subjects for the B.Sc. degree, London. It is written in an easy and pleasing style, not too technical, and can be read with interest and profit by all those employed in public health work.

One is at first surprised at the inclusion in such a book of a chapter on water. Even if water is not technically a food, it is an essential article of diet. The bacteriology of water might, therefore, be included, though it seems unnecessary to deal with the sources, storage and purification of water.

Five chapters are devoted to the important subjects of milk and milk products. The classification of the bacteria found in milk is a good one. A very interesting description is given in the chapters on butter and cheese of the part played by bacteria in the production of these nutritive articles of diet. The author while admitting "an appliance so designed that all milk heated to 65° C. for a full thirty minutes and promptly cooled, yields a wholesome, and to the best of our knowledge, a harmless milk," yet cannot accept





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without qualification the statement made elsewhere that pasteurization destroys pathogenic bacteria and renders milk safe. The unsatisfactory results noted in his observations might have been due to the type of appliance used. There does not seem to be, in this country at least, any difficulty in obtaining a safe pasteurized milk, i.e., milk subjected to a temperature of 145° F. (63° C.) for one half hour, and then immediately cooled to a temperature of 45° F. or below and held at this temperature until delivered to the consumer. The manner in which certified milk can be produced is very clearly indicated. While a fresh, clean and safe milk is much more desirable than a pasteurized one, yet on account of its difficulty of production and higher cost, we must rely on proper pasteurization to make milk safe for the great bulk of our population.

The last chapter deals with the significance of ptomaines and putrefactive bacteria, the Gartner group infections and botulinus infections. Dr. Dukes brings out very clearly that there are two principal types of bacterial food poisoning, one due to the aerobic bacilli of the Gartner group and the other to the anaerobic *B. botulinus*. This little book can be recommended to all students of bacteriology and of public health. It can well fit into a place on the shelf of any doctor's book-case. R. ST. J. MACDONALD

**Living Organisms.** An account of their origin and evolution. By Edwin S. Goodrich, F.R.S. 200 pages, 60 illustrations. Price \$1.75. The Oxford University Press, Canadian Branch, Toronto, 1924.

As stated in the short preface, this book deals "with modern views on the nature of life and the relations of living organisms to their environment, and with the latest advances in our knowledge of heredity and kindred problems. It is written not only for the scientific student but for the general reader."

The contents are divided into nine chapters which are well synopsised and contain as well a list of illustrations, a good bibliography, and an index.

The style throughout is clear and as free from technical terms as possible. Facts are presented in a logical fashion and different theories adequately dealt with. The scope and effect of different sciences such as natural science, philosophy, physiological psychology, etc., are outlined and touched upon as they bear on the points at issue. In Chapter 8 the author states that "what guiding principle there may be behind the whole of creation is a subject outside the scope of natural science and on the whole it can not express an opinion." Later he expresses his belief in stating that "there can scarcely be any doubt that in the main the phylogenies represent the real course of evolution and (such) mistakes in details do not shake our faith in the correctness of the conclusions as a whole."

Much that the book contains will be familiar to the medical reader whether remembered or forgotten. There is a philosophical and political trend as shown in the concluding sentence: "Some knowledge of the chief results of the scientific study of organic evolution should be acquired by all, and is indeed essential for the guidance of those who wish to promote the welfare of the human race on rational principles"—which should appeal not only to the professional but the lay reader as well. A. H. W. CAULFIELD

**International Clinics.** Vol 1, 35th series, 1925. Philadelphia, London and Montreal. The J. B. Lippincott Company, 1925. Price \$2.50.

This first volume of the 35th series opens with two of Prof. L. F. Barker's Medical Clinics, dealing with staphylococcus septicemia and the treatment of psychoneuroses. The departments of diagnosis and treatment, mental diseases, and surgery follow. The volume closes with an article on deaths from tobacco, and a seventy-eight page review of the progress of medicine for 1924. This review gives the physician a concise abstract of some of the most important contributions of the year. The contributions to all the departments are well written and many of them are well illustrated. J. H. E. ELLIOTT

**Spontaneous Recurrent Abortion.**—Arthur H. Curtis, Chicago, says that the three patients who have been studied in this work introduce two common factors of interest: First, all had lesions that offered easy portals of entry for fresh infection, and, secondly, all suffered from kidney disturbance. It appears that all three experienced frequent renewal of infection, suggesting that the occurrence of spontaneous abortion tends to be dependent on fresh exacerbations, rather than on dissemination from low-grade chronic foci. Spontaneous abortion is relatively frequent in patients who are free from syphilis and have no gross abnormalities of the pelvic organs. Three barren patients with a pronounced history of habitual abortion all revealed active foci of infection with associated kidney involvement. Two have borne healthy children since relieved of their infec-

tions; the third with a history of eleven abortions, is now well and is nearly six months pregnant. Intravenous injection of numerous pregnant rabbits with fresh cultures of hemolytic streptococci, obtained from these patients, has invariably resulted in prompt termination of pregnancy. Control experiments suggest that other virulent bacteria do not possess such a high degree of specificity. Focal infections with a tendency to fresh exacerbations appear to be an important cause of otherwise inexplicable spontaneous abortion in women. Repeated inoculation of susceptible patients with bacteria from the oral cavities of human carriers of infection may also be a factor. Low-grade chronic foci are probably a less serious menace to the growing fetus.—*Jour. Am. Med. Ass.*, April 25, 1925.